SOLICITATION/CONTRACT/ORDER FOR COMMERCIAL ITEMS
OFFEROR TO COMPLETE BLOCKS 12, 17, 23, 24, & 30

1. REQUISITION NUMBER	PAGE 1 OF
PR-CI-03-10163	

2. CONTRACT NO.	3. AWARD/EFFECTIVE DATE	4. ORDER NUMBER	5. SOLICITATION NUMBER	6.SOLICITATION ISSUE DATE
			PR-CI-03-10163	

7. FOR SOLICITATION INFORMATION CALL:	a. NAME	b. TELEPHONE NUMBER *(No collect calls)*	8. OFFER DUE DATE/ LOCAL TIME
	SCOTT THARP	**(513) 487-2092**	**2/10/2003 12:00 PM**

9. ISSUED BY — CODE

Environmental Protection Agency
Contracts Management Division
4411 Montgomery Road
Norwood, OH 45212

10. THIS ACQUISITION IS

[X] UNRESTRICTED

[] SET ASIDE: % FOR
[] SMALL BUSINESS
[] SMALL DISADV. BUSINESS
[]8(A)

NAICS: **334519**
SIZE STANDARD:

11. DELIVERY FOR FOB DESTINATION UNLESS BLOCK IS MARKED
[] SEE SCHEDULE

12. DISCOUNT TERMS

[] 13a. THIS CONTRACT IS A RATED ORDER UNDER DPAS (15 CFR 700)

13b. RATING

14. METHOD OF SOLICITATION

[] RFQ [] IFB [X] RFP

15. DELIVER TO — CODE

16. ADMINISTERED BY — CODE

17a. CONTRACTOR/ OFFEROR — CODE — FACILITY CODE

TELEPHONE NO.

18a. PAYMENT WILL BE MADE BY — CODE

Environmental Protection Agency
Research Triangle Park Financial
Management Center (D143-02)
Research Triangle Park, NC 27711

[ ] 17b. CHECK IF REMITTANCE IS DIFFERENT AND PUT SUCH ADDRESS IN OFFER

18b. SUBMIT INVOICES TO ADDRESS SHOWN IN BLOCK 18a. UNLESS BLOCK BELOW IS CHECKED
[] SEE ADDENDUM

19. ITEM NO.	20. SCHEDULE OF SUPPLIES/SERVICES	21. QUANTITY	22. UNIT	23. UNIT PRICE	24. AMOUNT
	SEE ATTACHED DOCUMENTS *(Attach Additional sheets as Necessary)*				

25. ACCOUNTING AND APPROPRIATION DATA

N/A

26. TOTAL AWARD AMOUNT *(For Govt. Use Only)*

[] 27a. SOLICITATION INCORPORATES BY REFERENCE FAR 52.212-1, 52.212-4. FAR 52.212-3 AND 52.212-5 ARE ATTACHED. [] ARE [] ARE NOT ATTACHED.

[] 27b. CONTRACT/PURCHASE ORDER INCORPORATES BY REFERENCE FAR 52.212-4. FAR 52.212-5 IS ATTACHED. ADDENDA [] ARE [] ARE NOT ATTACHED.

28. CONTRACTOR IS REQUIRED TO SIGN THIS DOCUMENT AND RETURN COPIES
[] TO ISSUING OFFICE. CONTRACTOR AGREES TO FURNISH AND DELIVER ALL ITEMS SET FORTH OR OTHERWISE IDENTIFIED ABOVE AND ON ANY ADDITIONAL SHEETS SUBJECT TO THE TERMS AND CONDITIONS SPECIFIED HEREIN.

29. AWARD OF CONTRACT: REFERENCE _____ OFFER
[] DATED _____. YOUR OFFER ON SOLICITATION (BLOCK 5), INCLUDING ANY ADDITIONS OR CHANGES WHICH ARE SET FORTH HEREIN, IS ACCEPTED AS TO ITEMS:

30a. SIGNATURE OF OFFEROR/CONTRACTOR

31a. UNITED STATES OF AMERICA *(SIGNATURE OF CONTRACTING OFFICER)*

30b. NAME AND TITLE OF SIGNER *(TYPE OR PRINT)* — 30c. DATE SIGNED

31b. NAME OF CONTRACTING OFFICER *(TYPE OR PRINT)*
DAVID H. PLAGGE

31c. DATE SIGNED

32a. QUANTITY IN COLUMN 21 HAS BEEN
[ ] RECEIVED [ ] INSPECTED [ ] ACCEPTED AND CONFORMS TO THE CONTRACT, EXCEPT AS NOTED

33. SHIP NUMBER — PARTIAL — FINAL

34. VOUCHER NUMBER

35. AMOUNT VERIFIED CORRECT FOR

36. PAYMENT
[ ] COMPLETE [ ] PARTIAL [ ] FINAL

37. CHECK NUMBER

32b. SIGNATURE OF AUTHORIZED GOVT. REPRESENTATIVE — 32c. DATE

38. S/R ACCOUNT NUMBER

39. S/R VOUCHER NUMBER

40. PAID BY

41a. I CERTIFY THIS ACCOUNT IS CORRECT AND PROPER FOR PAYMENT

42a. RECEIVED BY *(Print)*

41b. SIGNATURE AND TITLE OF CERTIFYING OFFICER — 41c. DATE

42b. RECEIVED AT *(Location)*

42c. DATE REC'D *(YY/MM/DD)*

42d. TOTAL CONTAINERS

AUTHORIZED FOR LOCAL REPRODUCTION

SEE REVERSE FOR OMB CONTROL NUMBER AND PAPERWORK BURDEN STATEMENT

STANDARD FORM 1449 (10-95)
Prescribed by GSA - FAR (48 CFR) 53.212

Public reporting burden for this collection of information is estimated to average 45 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the FAR Secretariat (VRS), Office of Federal Acquisition Policy, GSA, Washington, DC 20405.	OMB NO: 9000-0136 Expires: 09/30/98

TABLE OF CONTENTS

1. CONTRACT TERMS AND CONDITIONS -- COMMERCIAL ITEMS (FAR 52.212-4) (FEB 2002) DEVIATION

(a) *Inspection/Acceptance.* The Contractor shall only tender for acceptance those items that conform to the requirements of this contract. The Government reserves the right to inspect or test any supplies or services that have been tendered for acceptance. The Government may require repair or replacement of nonconforming supplies or reperformance of nonconforming services at no increase in contract price. The Government must exercise its post-acceptance rights --

(1) Within a reasonable time after the defect was discovered or should have been discovered; and

(2) Before any substantial change occurs in the condition of the item, unless the change is due to the defect in the item.

(b) *Assignment.* The Contractor or its assignee may assign its rights to receive payment due as a result of performance of this contract to a bank, trust company, or other financing institution, including any Federal lending agency in accordance with the Assignment of Claims Act (31 U.S.C.3727). However, when a third party makes payment (e.g., use of the Governmentwide commercial purchase card), the Contractor may not assign its rights to receive payment under this contract.

(c) *Changes.* Changes in the terms and conditions of this contract may be made only by written agreement of the parties.

(d) *Disputes.* This contract is subject to the Contract Disputes Act of 1978, as amended (41 U.S.C. 601-613). Failure of the parties to this contract to reach agreement on any request for equitable adjustment, claim, appeal or action arising under or relating to this contract shall be a dispute to be resolved in accordance with the clause at FAR 52.233-1, Disputes, which is incorporated herein by reference. The Contractor shall proceed diligently with performance of this contract, pending final resolution of any dispute arising under the contract.

(e) *Definitions.* The clause at FAR 52.202-1, Definitions, is incorporated herein by reference.

(f) *Excusable delays.* The Contractor shall be liable for default unless nonperformance is caused by an occurrence beyond the reasonable control of the Contractor and without its fault or negligence such as, acts of God or the public enemy, acts of the Government in either its sovereign or contractual capacity, fires, floods, epidemics, quarantine restrictions, strikes, unusually severe weather, and delays of common carriers. The Contractor shall notify the Contracting Officer in writing as soon as it is reasonably possible after the commencement of any excusable delay, setting forth the full

particulars in connection therewith, shall remedy such occurrence with all reasonable dispatch, and shall promptly give written notice to the Contracting Officer of the cessation of such occurrence.

(g) *Invoice.* (1) The Contractor shall submit an original invoice and three copies (or electronic invoice, if authorized) to the address designated in the contract to receive invoices. An invoice must include--

(i) Name and address of the Contractor;

(ii) Invoice date and number;

(iii) Contract number, contract line item number and, if applicable, the order number;

(iv) Description, quantity, unit of measure, unit price and extended price of the items delivered;

(v) Shipping number and date of shipment, including the bill of lading number and weight of shipment if shipped on Government bill of lading;

(vi) Terms of any discount for prompt payment offered;

(vii) Name and address of official to whom payment is to be sent;

(viii) Name, title, and phone number of person to notify in event of defective invoice; and

(ix) Taxpayer Identification Number (TIN). The Contractor shall include its TIN on the invoice only if required elsewhere in this contract.

(x) Electronic funds transfer (EFT) banking information.

(A) The Contractor shall include EFT banking information on the invoice only if required elsewhere in this contract.

(B) If EFT banking information is not required to be on the invoice, in order for the invoice to be a proper invoice, the Contractor shall have submitted correct EFT banking information in accordance with the applicable solicitation provision, contract clause (e.g., 52.232-33, Payment by Electronic Funds Transfer--Central Contractor Registration, or 52.232-34, Payment by Electronic Funds Transfer--Other Than Central Contractor Registration), or applicable agency procedures.

(C) EFT banking information is not required if the Government waived the requirement to pay by EFT.

(2) Invoices will be handled in accordance with the Prompt Payment Act (31 U.S.C. 3903) and Office of Management and Budget (OMB) prompt payment regulations at 5 CFR part 1315.

(3) Contractors shall submit invoices upon delivery and acceptance of all supplies or services unless otherwise specified in the contract. **Invoices shall be submitted as follows:**

(i) **One (1) original and two (2) copies of the invoice to:**

U.S. Environmental Protection Agency
Research Triangle Park Financial Management Center
(Mail Code 32)
Research Triangle Park, NC 27711

(ii) **One (1) copy of the invoice to the Project Officer designated in the clause entitled "Contract Administration Representatives" (EP 52.242-100).**

(iii) **One (1) copy of the invoice to the Contracting Officer designated in the clause entitled "Contract Administration Representatives" (EP 52.242-100).**

(h) *Patent indemnity.* The Contractor shall indemnify the Government and its officers, employees and agents against liability, including costs, for actual or alleged direct or contributory infringement of, or inducement to infringe, any United States or foreign patent, trademark or copyright, arising out of the performance of this contract, provided the Contractor is reasonably notified of such claims and proceedings.

(i) *Payment.* Payment shall be made for items accepted by the Government that have been delivered to the delivery destinations set forth in this contract. The Government will make payment in accordance with the Prompt Payment Act (31 U.S.C. 3903) and OMB prompt payment regulations at 5 CFR part 1315. In connection with any discount offered for early payment, time shall be computed from the date of the invoice. For the purpose of computing the discount earned, payment shall be considered to have been made on the date which appears on the payment check or the specified payment date if an electronic funds transfer payment is made.

(j) *Risk of loss*. Unless the contract specifically provides otherwise, risk of loss or damage to the supplies provided under this contract shall remain with the Contractor until, and shall pass to the Government upon:

(1) Delivery of the supplies to a carrier, if transportation is f.o.b. origin; or

(2) Delivery of the supplies to the Government at the destination

specified in the contract, if transportation is f.o.b. destination.

(k) *Taxes.* The contract price includes all applicable Federal, State, and local taxes and duties.

(l) *Termination for the Government's convenience*. The Government reserves the right to terminate this contract, or any part hereof, for its sole convenience. In the event of such termination, the Contractor shall immediately stop all work hereunder and shall immediately cause any and all of its suppliers and subcontractors to cease work. Subject to the terms of this contract, the Contractor shall be paid a percentage of the contract price reflecting the percentage of the work performed prior to the notice of termination, plus reasonable charges the Contractor can demonstrate to the satisfaction of the Government using its standard record keeping system, have resulted from the termination. The Contractor shall not be required to comply with the cost accounting standards or contract cost principles for this purpose. This paragraph does not give the Government any right to audit the Contractor's records. The Contractor shall not be paid for any work performed or costs incurred which reasonably could have been avoided.

(m) *Termination for cause.* The Government may terminate this contract, or any part hereof, for cause in the event of any default by the Contractor, or if the Contractor fails to comply with any contract terms and conditions, or fails to provide the Government, upon request, with adequate assurances of future performance. In the event of termination for cause, the Government shall not be liable to the Contractor for any amount for supplies or services not accepted, and the Contractor shall be liable to the Government for any and all rights and remedies provided by law. If it is determined that the Government improperly terminated this contract for default, such termination shall be deemed a termination for convenience.

(n) *Title.* Unless specified elsewhere in this contract, title to items furnished under this contract shall pass to the Government upon acceptance, regardless of when or where the Government takes physical possession.

(o) *Warranty.* The Contractor warrants and implies that the items delivered hereunder are merchantable and fit for use for the particular purpose described in this contract.

(p) *Limitation of liability.* Except as otherwise provided by an express warranty, the Contractor will not be liable to the Government for consequential damages resulting from any defect or deficiencies in accepted items.

(q) *Other compliances.* The Contractor shall comply with all applicable Federal, State and local laws, executive orders, rules and regulations applicable to its performance under this contract.

(r) *Compliance with laws unique to Government contracts*. The Contractor agrees to comply with 31 U.S.C. 1352 relating to limitations on the use of appropriated funds to influence certain Federal contracts; 18 U.S.C. 431 relating to officials not to benefit; 40 U.S.C. 327, et seq., Contract Work Hours and Safety Standards Act; 41 U.S.C. 51-58, Anti-Kickback Act of 1986; 41 U.S.C. 265 and 10 U.S.C. 2409 relating to whistleblower protections; 49 U.S.C. 40118, Fly American; and 41 U.S.C. 423 relating to procurement integrity.

(s) *Order of precedence.* Any inconsistencies in this solicitation or contract shall be resolved by giving precedence in the following order:

(1) The schedule of supplies/services.

(2) The Assignments, Disputes, Payments, Invoice, Other Compliances, and Compliance with Laws Unique to Government Contracts paragraphs of this clause.

(3) The clause at 52.212-5.

(4) Addenda to this solicitation or contract, including any license agreements for computer software.

(5) Solicitation provisions if this is a solicitation.

(6) Other paragraphs of this clause.

(7) The Standard Form 1449.

(8) Other documents, exhibits, and attachments.

(9) The specification.

(t) *Incorporation of Contractor’s Plans*. The Contractor shall include in its proposal a Remedial Maintenance plan. The Contractor’s plan will be incorporated into the contract at award. In the case of any conflict between the Contractor’s Plans and the terms and conditions of this contract, the provisions of FAR 52.215-8, ORDER OF PRECEDENCE (Section I.1, by reference) shall prevail.

2. CONTRACT TERMS AND CONDITIONS REQUIRED TO IMPLEMENT STATUTES OR EXECUTIVE ORDERS -- COMMERCIAL ITEMS (FAR 52.212-5) (MAY 2002)

a) The Contractor shall comply with the following FAR clauses, which are incorporated in this contract by reference, to implement provisions of law or executive orders applicable to acquisitions of commercial items:

(1) 52.222-3, Convict Labor (E.O. 11755);

(2) 52.233-3, Protest after Award (31 U.S.C 3553).

(b) The Contractor shall comply with the FAR clauses in this paragraph (b) that the contracting officer has indicated as being incorporated in this contract by reference to implement provisions of law or Executive orders applicable to acquisitions of commercial items or components:

(Contracting Officer must check as appropriate.)

_X__ (1) 52.203-6, Restrictions on Subcontractor Sales to the Government, with Alternate I (41 U.S.C. 253g and 10 U.S.C. 2402).

___ (2) 52.219-3, Notice of HUBZone Small Business Set-Aside (Jan 1999).

_X_ (3) 52.219-4, Notice of Price Evaluation Preference for HUBZone Small Business Concerns (Jan 1999) (if the offeror elects to waive the preference, it shall so indicate in its offer).

___ (4) (i) 52.219-5, Very Small Business Set-Aside (Pub. L. 103-403, section 304, Small Business Reauthorization and Amendments Act of 1994).

___ (ii) Alternate I to 52.219-5.

___ (iii) Alternate II to 52.219-5.

_X__ (5) 52.219-8, Utilization of Small Business Concerns (15 U.S.C. 637 (d)(2) and (3)).

___ (6) 52.219-9, Small Business Subcontracting Plan (15 U.S.C. 637 (d)(4)).

___ (7) 52.219-14, Limitations on Subcontracting (15 U.S.C. 637(a)(14)).

___ (8) (i) 52.219-23, Notice of Price Evaluation Adjustment for Small Disadvantaged Business Concerns (Pub. L. 103-355, section 7102, and 10 U.S.C. 2323) (if the offeror elects to waive the adjustment, it shall so indicate in its offer).

___ (ii) Alternate I of 52.219-23.

___ (9) 52.219-25, Small Disadvantaged Business Participation Program-Disadvantaged Status and Reporting (Pub. L. 103-355, section 7102, and 10 U.S.C. 2323).

___ (10) 52.219-26, Small Disadvantaged Business Participation Program-Incentive Subcontracting (Pub. L. 103-355, section 7102, and 10 U.S.C. 2323).

_X_ (11) 52.222-21, Prohibition of Segregated Facilities (Feb 1999).

_X_ (12) 52.222-26, Equal Opportunity (E.O. 11246).

_X_ (13) 52.222-35, Equal Opportunity for Special Disabled Veterans, Veterans of the Vietnam Era, and Other Eligible Veterans (38 U.S.C. 4212).

_X_ (14) 52.222-36, Affirmative Action for Workers with Disabilities (29 U.S.C. 793).

_X_ (15) 52.222-37, Employment Reports on Special Disabled Veterans, Veterans of the Vietnam Era, and Other Eligible Veterans (38 U.S.C. 4212).

_X_ (16) 52.222-19, Child Labor-Cooperation with Authorities and Remedies (E.O. 13126).

___ (17)(i) 52.223-9, Estimate of Percentage of Recovered Material Content for EPA-Designated Products (42 U.S.C. 6962(c)(3)(A)(ii)).

___ (ii) Alternate I of 52.223-9 (42 U.S.C. 6962(i)(2)(C)).

_X_(18) 52.225-1, Buy American Act--Supplies (41 U.S.C. 10a-10d).

___(19)(i) 52.225-3, Buy American Act--North American Free Trade Agreement--Israeli Trade Act (41 U.S.C. 10a-10d, 19 U.S.C. 3301 note, 19 U.S.C. 2112 note).

___ (ii) Alternate I of 52.225-3.

___ (iii) Alternate II of 52.225-3.

___ (20) 52.225-5, Trade Agreements (19 U.S.C. 2501, et seq., 19 U.S.C. 3301 note).

_X_ (21) 52.225-13, Restriction on Certain Foreign Purchases (E.O. 12722, 12724, 13059, 13067, 13121, and 13129).

___ (22) 52.225-15, Sanctioned European Union Country End Products (E.O. 12849).

___ (23) 52.225-16, Sanctioned European Union Country Services (E.O.

12849).

___ (24) 52.232-33, Payment by Electronic Funds Transfer-Central Contractor Registration (31 U.S.C. 3332).

_X_ (25) 52.232-34, Payment by Electronic Funds Transfer-Other Than Central Contractor Registration (31 U.S.C. 3332).

___ (26) 52.232-36, Payment by Third Party (31 U.S.C. 3332).

___ (27) 52.239-1, Privacy or Security Safeguards (5 U.S.C. 552a).

___ (28) (i) 52.247-64, Preference for Privately Owned U.S.-Flag Commercial Vessels (46 U.S.C. 1241).

___ (ii) Alternate I of 52.247-64.

(c) The Contractor shall comply with the FAR clauses in this paragraph (c), applicable to commercial services, which the Contracting Officer has indicated as being incorporated in this contract by reference to implement provisions of law or executive orders applicable to acquisitions of commercial items or components:

(Contracting Officer must check as appropriate.)

___ (1) 52.222-41, Service Contract Act of 1965, As Amended (41 U.S.C. 351, et seq.).

___ (2) 52.222-42, Statement of Equivalent Rates for Federal Hires (29 U.S.C. 206 and 41 U.S.C. 351, et seq.).

___ (3) 52.222-43, Fair Labor Standards Act and Service Contract Act -- Price Adjustment (Multiple Year and Option Contracts) (29 U.S.C.206 and 41 U.S.C. 351, et seq.).

___ (4) 52.222-44, Fair Labor Standards Act and Service Contract Act -- Price Adjustment (29 U.S.C. 206 and 41 U.S.C. 351, et seq.).

___ (5) 52.222-47, SCA Minimum Wages and Fringe Benefits Applicable to Successor Contract Pursuant to Predecessor Contractor Collective Bargaining Agreement (CBA) (41 U.S.C. 351, et seq.).

(d) *Comptroller General Examination of Record.* The Contractor shall comply with the provisions of this paragraph (d) if this contract was awarded using other than sealed bid, is in excess of the simplified acquisition threshold, and does not contain the clause at 52.215-2, Audit and Records -- Negotiation.

(1) The Comptroller General of the United States, or an authorized

representative of the Comptroller General, shall have access to and right to examine any of the Contractor's directly pertinent records involving transactions related to this contract.

(2) The Contractor shall make available at its offices at all reasonable times the records, materials, and other evidence for examination, audit, or reproduction, until 3 years after final payment under this contract or for any shorter period specified in FAR Subpart 4.7, Contractor Records Retention, of the other clauses of this contract. If this contract is completely or partially terminated, the records relating to the work terminated shall be made available for 3 years after any resulting final termination settlement. Records relating to appeals under the disputes clause or to litigation or the settlement of claims arising under or relating to this contract shall be made available until such appeals, litigation, or claims are finally resolved.

(3) As used in this clause, records include books, documents, accounting procedures and practices, and other data, regardless of type and regardless of form. This does not require the Contractor to create or maintain any record that the Contractor does not maintain in the ordinary course of business or pursuant to a provision of law.

(e) Notwithstanding the requirements of the clauses in paragraphs (a), (b), (c) or (d) of this clause, the Contractor is not required to include any FAR clause, other than those listed below (and as may be required by an addenda to this paragraph to establish the reasonableness of prices under Part 15), in a subcontract for commercial items or commercial components --

(1) 52.222-26, Equal Opportunity (E.O. 11246);

(2) 52.222-35, Equal Opportunity for Special Disabled Veterans, Veterans of the Vietnam Era, and Other Eligible Veterans (38 U.S.C. 4212);

(3) 52.222-36, Affirmative Action for Workers with Disabilities (29 U.S.C. 793);

(4) 52.247-64, Preference for Privately-Owned U.S. Flag Commercial Vessels (46 U.S.C. 1241) (flow down not required for subcontracts awarded beginning May 1, 1996); and

(5) 52.222-41, Service Contract Act of 1965, As Amended (41 U.S.C. 351, *et seq.*).

3. INSTRUCTIONS TO OFFERORS -- COMMERCIAL ITEMS (FAR 52.212-1) (OCT 2000)

(a) *North American Industry Classification System (NAICS) code and small business size standard.* The NAICS code and small business size standard for this acquisition appear in Block 10 of the solicitation cover sheet (SF 1449). However, the small business size standard for a concern which submits an offer in its own name, but which proposes to furnish an item which it did not itself manufacture, is 500 employees.

(b) *Submission of offers.* Submit signed and dated offers to the office specified in this solicitation at or before the exact time specified in this solicitation. Offers may be submitted on the SF 1449, letterhead stationery, or as otherwise specified in the solicitation. As a minimum, offers must show--

(1) The solicitation number;

(2) The time specified in the solicitation for receipt of offers;

(3) The name, address, and telephone number of the offeror;

(4) A technical description of the items being offered in sufficient detail to evaluate compliance with the requirements in the solicitation. This may include product literature, or other documents, if necessary;

(5) Terms of any express warranty;

(6) Price and any discount terms;

(7) "Remit to" address, if different than mailing address;

(8) A completed copy of the representations and certifications at FAR 52.212-3;

(9) Acknowledgment of Solicitation Amendments;

(10) Past performance information, when included as an evaluation factor, to include recent and relevant contracts for the same or similar items and other references (including contract numbers, points of contact with telephone numbers and other relevant information); and

(11) If the offer is not submitted on the SF 1449, include a statement specifying the extent of agreement with all terms, conditions, and provisions included in the solicitation. Offers that fail to furnish required representations or information, or reject the terms and conditions of the solicitation may be excluded from consideration.

(c) *Period for acceptance of offers*. The offeror agrees to hold the prices

in its offer firm for 30 calendar days from the date specified for receipt of offers, unless another time period is specified in an addendum to the solicitation.

(d) *Product samples*. When required by the solicitation, product samples shall be submitted at or prior to the time specified for receipt of offers. Unless otherwise specified in this solicitation, these samples shall be submitted at no expense to the Government, and returned at the sender's request and expense, unless they are destroyed during preaward testing.

(e) *Multiple offers*. Offerors are encouraged to submit multiple offers presenting alternative terms and conditions or commercial items for satisfying the requirements of this solicitation. Each offer submitted will be evaluated separately.

(f) *Late submissions, modifications, revisions, and withdrawals of offers.* (1) Offerors are responsible for submitting offers, and any modifications, revisions, or withdrawals, so as to reach the Government office designated in the solicitation by the time specified in the solicitation. If no time is specified in the solicitation, the time for receipt is 4:30 p.m., local time, for the designated Government office on the date that offers or revisions are due.

(2)(i) Any offer, modification, revision, or withdrawal of an offer received at the Government office designated in the solicitation after the exact time specified for receipt of offers is ``late'' and will not be considered unless it is received before award is made, the Contracting Officer determines that accepting the late offer would not unduly delay the acquisition; and--

(A) If it was transmitted through an electronic commerce method authorized by the solicitation, it was received at the initial point of entry to the Government infrastructure not later than 5:00 p.m. one working day prior to the date specified for receipt of offers; or

(B) There is acceptable evidence to establish that it was received at the Government installation designated for receipt of offers and was under the Government's control prior to the time set for receipt of offers; or

(C) If this solicitation is a request for proposals, it was the only proposal received.

(ii) However, a late modification of an otherwise successful offer, that makes its terms more favorable to the Government, will be considered at any time it is received and may be accepted.

(3) Acceptable evidence to establish the time of receipt at the

Government installation includes the time/date stamp of that installation on the offer wrapper, other documentary evidence of receipt maintained by the installation, or oral testimony or statements of Government personnel.

(4) If an emergency or unanticipated event interrupts normal Government processes so that offers cannot be received at the Government office designated for receipt of offers by the exact time specified in the solicitation, and urgent Government requirements preclude amendment of the solicitation or other notice of an extension of the closing date, the time specified for receipt of offers will be deemed to be extended to the same time of day specified in the solicitation on the first work day on which normal Government processes resume.

(5) Offers may be withdrawn by written notice received at any time before the exact time set for receipt of offers. Oral offers in response to oral solicitations may be withdrawn orally. If the solicitation authorizes facsimile offers, offers may be withdrawn via facsimile received at any time before the exact time set for receipt of offers, subject to the conditions specified in the solicitation concerning facsimile offers. An offer may be withdrawn in person by an offeror or its authorized representative if, before the exact time set for receipt of offers, the identity of the person requesting withdrawal is established and the person signs a receipt for the offer.

(g) *Contract award (not applicable to Invitation for Bids)*. The Government intends to evaluate offers and award a contract without discussions with offerors. Therefore, the offeror's initial offer should contain the offeror's best terms from a price and technical standpoint. However, the Government reserves the right to conduct discussions if later determined by the Contracting Officer to be necessary. The Government may reject any or all offers if such action is in the public interest; accept other than the lowest offer; and waive informalities and minor irregularities in offers received.

(h) *Multiple awards*. The Government may accept any item or group of items of an offer, unless the offeror qualifies the offer by specific limitations. Unless otherwise provided in the Schedule, offers may not be submitted for quantities less than those specified. The Government reserves the right to make an award on any item for a quantity less than the quantity offered, at the unit prices offered, unless the offeror specifies otherwise in the offer.

(i) Availability of requirements documents cited in the solicitation.
(1)(i) The GSA Index of Federal Specifications, Standards and Commercial Item Descriptions, FPMR Part 101-29, and copies of specifications, standards, and commercial item descriptions cited in this solicitation may be obtained for a fee by submitting a request to--

GSA Federal Supply Service Specifications Section,

Suite 8100,
470 East L'Enfant Plaza, SW, Washington, DC 20407,
Telephone (202) 619-8925,
Facsimile (202) 619-8978.

(ii) If the General Services Administration, Department of Agriculture, or Department of Veterans Affairs issued this solicitation, a single copy of specifications, standards, and commercial item descriptions cited in this solicitation may be obtained free of charge by submitting a request to the addressee in paragraph (i)(1)(i) of this provision. Additional copies will be issued for a fee.

(2) The DoD Index of Specifications and Standards (DoDISS) and documents listed in it may be obtained from the--

Department of Defense Single Stock Point (DoDSSP),
Building 4, Section D,
700 Robbins Avenue,
Philadelphia, PA 19111-5094,
Telephone (215) 697- 2667/2179,
Facsimile (215) 697-1462.

(i) Automatic distribution may be obtained on a subscription basis.

(ii) Order forms, pricing information, and customer support information may be obtained--

(A) By telephone at (215) 697-2667/2179; or

(B) Through the DoDSSP Internet site at http://assist.daps.mil.

(3) Nongovernment (voluntary) standards must be obtained from the organization responsible for their preparation, publication, or maintenance.

(j) Data Universal Numbering System (DUNS) Number. (Applies to offers exceeding $25,000.) The offeror shall enter, in the block with its name and address on the cover page of its offer, the annotation ‘‘DUNS’’ followed by the DUNS number that identifies the offeror’s name and address. If the offeror does not have a DUNS number, it should contact Dun and Bradstreet to obtain one at no charge. An offeror within the United States may call 1-800-333-0505. The offeror may obtain more information regarding the DUNS number, including locations of local Dun and Bradstreet Information Services offices for offerors located outside the United States, from the Internet home page at http://www.customerservice@dnb.com. If an offeror is unable to locate a local service center, it may send an e-mail to Dun and Bradstreet at globalinfo@mail.dnb.com.

4. EVALUATION -- COMMERCIAL ITEMS (FAR 52.212-2) (JAN 1999)

(a) The Government will award a contract resulting from this solicitation to the responsible offeror whose offer conforming to the solicitation will be most advantageous to the Government, price and other factors considered. The following factors shall be used to evaluate offers:

SEE ATTACHED TECHNICAL EVALUATION CRITERIA

Technical and past performance, when combined, are significantly more important than cost.

(b) *Options*. The Government will evaluate offers for award purposes by adding the total price for all options to the total price for the basic requirement. The Government may determine that an offer is unacceptable if the option prices are significantly unbalanced. Evaluation of options shall not obligate the Government to exercise the option(s).

(c) A written notice of award or acceptance of an offer, mailed or otherwise furnished to the successful offeror within the time for acceptance specified in the offer, shall result in a binding contract without further action by either party. Before the offer's specified expiration time, the Government may accept an offer (or part of an offer), whether or not there are negotiations after its receipt, unless a written notice of withdrawal is received before award.

5. OFFEROR REPRESENTATIONS AND CERTIFICATIONS -- COMMERCIAL ITEMS (FAR 52.212-3) (JUL 2002)

(a) *Definitions.* As used in this provision:

"Emerging small business" means a small business concern whose size is no greater than 50 percent of the numerical size standard for the NAICS code designated.

"Forced or indentured child labor" means all work or service-

(1) Exacted from any person under the age of 18 under the menace of any penalty for its nonperformance and for which the worker does not offer himself voluntarily; or

(2) Performed by any person under the age of 18 pursuant to a contract the enforcement of which can be accomplished by process of penalties.

"Service-disabled veteran-owned small business concern"-

(1) Means a small business concern-

(i) Not less than 51 percent of which is owned by one or more service-disabled veterans or, in the case of any publicly owned business, not less than 51 percent of the stock of which is owned by one or more service-disabled veterans; and

(ii) The management and daily business operations of which are controlled by one or more service-disabled veterans or, in the case of a veteran with permanent and severe disability, the spouse or permanent caregiver of such veteran.

(2) Service-disabled veteran means a veteran, as defined in 38 U.S.C. 101(2), with a disability that is service-connected, as defined in 38 U.S.C. 101(16).

"Small business concern" means a concern, including its affiliates, that is independently owned and operated, not dominant in the field of operation in which it is bidding on Government contracts, and qualified as a small business under the criteria in 13 CFR Part 121 and size standards in this solicitation.

"Veteran-owned small business concern" means a small business concern-

(1) Not less than 51 percent of which is owned by one or more veterans(as defined at 38 U.S.C. 101(2)) or, in the case of any publicly owned business, not less than 51 percent of the stock of which is owned by one or more veterans; and

(2) The management and daily business operations of which are controlled by one or more veterans.

"Women-owned business concern" means a concern which is at least 51 percent owned by one or more women; or in the case of any publicly owned business, at least 51 percent of the its stock is owned by one or more women; and whose management and daily business operations are controlled by one or more women.

"Women-owned small business concern" means a small business concern --

(1) That is at least 51 percent owned by one or more women or, in the case of any publicly owned business, at least 51 percent of the stock of which is owned by one or more women; and

(2) Whose management and daily business operations are controlled by one or more women.

(b) *Taxpayer identification number (TIN) (26 U.S.C. 6109, 31 U.S.C. 7701)*. (Not applicable if the offeror is required to provide this information to a central contractor registration database to be eligible for award.)

(1) All offerors must submit the information required in paragraphs (b)(3) through (b)(5) of this provision to comply with debt collection requirements of 31 U.S.C. 7701(c) and 3325(d), reporting requirements of 26 U.S.C. 6041, 6041A, and 6050M, and implementing regulations issued by the Internal Revenue Service (IRS).

(2) The TIN may be used by the government to collect and report on any delinquent amounts arising out of the offeror's relationship with the Government (31 U.S.C. 7701(c)(3)). If the resulting contract is subject to the payment reporting requirements described in FAR 4.904, the TIN provided hereunder may be matched with IRS records to verify the accuracy of the offeror's TIN.]

(3) Taxpayer Identification Number (TIN).

[ ] TIN:_____.

[ ] TIN has been applied for.

[ ] TIN is not required because:

[ ] Offeror is a nonresident alien, foreign corporation, or foreign partnership that does not have income effectively connected with the conduct of a trade or business in the United States and does not have an office or place of business or a fiscal paying agent in the United States;

[ ] Offeror is an agency or instrumentality of a foreign government;

[ ] Offeror is an agency or instrumentality of the Federal Government;

(4) Type of organization.

[ ] Sole proprietorship;

[ ] Partnership;

[ ] Corporate entity (not tax-exempt);

[ ] Corporate entity (tax-exempt);

[ ] Government entity (Federal, State, or local);

[ ] Foreign government;

[ ] International organization per 26 CFR 1.6049-4;

[ ] Other _____.

(5) Common parent.

[ ] Offeror is not owned or controlled by a common parent:

[ ] Name and TIN of common parent:

Name _____

TIN _____

(c) Offerors must complete the following representations when the resulting contract is to be performed inside the United States, its territories or possessions, Puerto Rico, the Trust Territory of the Pacific Islands, or the District of Columbia. Check all that apply.

(1) *Small business concern.* The offeror represents as part of its offer that it [ ]is, [ ]is not a small business concern.

(2) *Veteran-owned small business concern. [Complete only if the offeror represented itself as a small business concern in paragraph (c)(1) of this provision.]* The offeror represents as part of its offer that it [ ]is, [ ]is not a veteran-owned small business concern.

(3) Service-disabled veteran-owned small business concern. [Complete only if the offeror represented itself as a veteran-owned small business

concern in paragraph (c)(2) of this provision.] The offeror represents as part of its offer that it [ ]is, [ ]is not a service-disabled veteran-owned small business concern.

(4) *Small disadvantaged business concern. [Complete only if the offeror represented itself as a small business concern in paragraph (c)(1) of this provision.]* The offeror represents, for general statistical purposes, that it [ ]is, [ ]is not, a small disadvantaged business concern as defined in 13 CFR 124.1002.

(5) *Women-owned small business concern. [Complete only if the offeror represented itself as a small business concern in paragraph (c)(1) of this provision.]* The offeror represents that it [ ]is, [ ]is not a women-owned small business concern.

Note: Complete paragraphs (c)(6) and (c)(7) only if this solicitation is expected to exceed the simplified acquisition threshold.

(6) *Women-owned business concern (other than small business concern). [Complete only if the offeror is a women-owned business concern and did not represent itself as a small business concern in paragraph (c)(1) of this provision.]*. The offeror represents that it [ ]is, a women-owned business concern.

(7) *Tie bid priority for labor surplus area concerns.* If this is an invitation for bid, small business offerors may identify the labor surplus areas in which costs to be incurred on account of manufacturing or production (by offeror or first-tier subcontractors) amount to more than 50 percent of the contract price:

_____

(8) Small Business Size for the Small Business Competitiveness Demonstration Program and for the Targeted Industry Categories under the Small Business Competitiveness Demonstration Program. *[Complete only if the offeror has represented itself to be a small business concern under the size standards for this solicitation.]*

(i) *[Complete only for solicitations indicated in an addendum as being set-aside for emerging small businesses in one of the four designated industry groups (DIGs).]* The offeror represents as part of its offer that it [ ]is, [ ]is not an emerging small business.

(ii) *[Complete only for solicitations indicated in an addendum as being for one of the targeted industry categories (TICs) or four designated industry groups (DIGs).]* Offeror represents as follows:

(A) Offeror's number of employees for the past 12 months (check the Employees column if size standard stated in the solicitation is expressed in terms of number of employees); or

(B) Offeror's average annual gross revenue for the last 3 fiscal years (check the Average Annual Gross Number of Revenues column if size standard stated in the solicitation is expressed in terms of annual receipts).

(Check one of the following):

Number of Employees	**Average Annual Gross Revenues**
___ 50 or fewer	___$1 million or less
___ 51-100	___$1,000,001-$2 million
___101-250	___$2,000,001-$3.5 million
___251-500	___$3,500,001-$5 million
___501-750	___$5,000,001-$10 million
___751-1,000	___$10,000,001-$17 million
___Over 1,000	___Over $17 million

(9) *[Complete only if the solicitation contains the clause at FAR 52.219-23, Notice of Price Evaluation Adjustment for Small Disadvantaged Business Concerns, or FAR 52.219-25, Small Disadvantaged Business Participation Program-Disadvantaged Status and Reporting, and the offeror desires a benefit based on its disadvantaged status.]*

(i) *General.* The offeror represents that either-

(A) It [ ]is, [ ]is not certified by the Small Business Administration as a small disadvantaged business concern and identified, on the date of this representation, as a certified small disadvantaged business concern in the database maintained by the Small Business Administration (PRO-Net), and that no material change in disadvantaged ownership and control has occurred since its certification, and, where the concern is owned by one or more individuals claiming disadvantaged status, the net worth of each individual upon whom the certification is based does not exceed $750,000 after taking into account the applicable exclusions set forth at 13 CFR 124.104(c)(2); or

(B) It [ ]has, [ ]has not submitted a completed application to the Small Business Administration or a Private Certifier to be certified as a small disadvantaged business concern in accordance with 13 CFR 124, Subpart B, and a decision on that application is pending, and that no material change in disadvantaged ownership and control has occurred since its application was submitted.

(ii) [ ]*Joint Ventures under the Price Evaluation Adjustment for Small Disadvantaged Business Concerns.* The offeror represents, as part of its

offer, that it is a joint venture that complies with the requirements in 13 CFR 124.1002(f) and that the representation in paragraph (c)(9)(i) of this provision is accurate for the small disadvantaged business concern that is participating in the joint venture. *[The offeror shall enter the name of the small disadvantaged business concern that is participating in the joint venture:* _____.]

(10) *HUBZone small business concern. [Complete only if the offeror represented itself as a small business concern in paragraph (c)(1) of this provision.]* The offeror represents, as part of its offer, that--

(i) It [ ] is, [ ] is not a HUBZone small business concern listed, on the date of this representation, on the List of Qualified HUBZone Small Business Concerns maintained by the Small Business Administration, and no material change in ownership and control, principal office, or HUBZone employee percentage has occurred since it was certified by the Small Business Administration in accordance with 13 CFR part 126; and

(ii) It [ ] is, [ ] is not a joint venture that complies with the requirements of 13 CFR part 126, and the representation in paragraph (c)(10)(i) of this provision is accurate for the HUBZone small business concern or concerns that are participating in the joint venture. *[The offeror shall enter the name or names of the HUBZone small business concern or concerns that are participating in the joint venture:*_____*.]* Each HUBZone small business concern participating in the joint venture shall submit a separate signed copy of the HUBZone representation.

(d) *Representations required to implement provisions of Executive Order 11246* --(1) Previous contracts and compliance. The offeror represents that --

(i) It [ ]has, [ ]has not, participated in a previous contract or subcontract subject to the Equal Opportunity clause of this solicitation; and

(ii) It [ ]has, [ ]has not, filed all required compliance reports.

(2) Affirmative Action Compliance. The offeror represents that --

(i) It [ ]has developed and has on file, [ ]has not developed and does not have on file, at each establishment, affirmative action programs required by rules and regulations of the Secretary of Labor (41 CFR parts 60-1 and 60-2), or

(ii) It [ ]has not previously had contracts subject to the written affirmative action programs requirement of the rules and regulations of the Secretary of Labor.

(e) *Certification Regarding Payments to Influence Federal Transactions (31 U.S.C. 1352).* (Applies only if the contract is expected to exceed $100,000.)

By submission of its offer, the offeror certifies to the best of its knowledge and belief that no Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress or an employee of a Member of Congress on his or her behalf in connection with the award of any resultant contract.

(f) *Buy American Act Certificate.* (Applies only if the clause at Federal Acquisition Regulation (FAR) 52.225-1, Buy American Act--Supplies, is included in this solicitation.)

(1) The offeror certifies that each end product, except those listed in paragraph (f)(2) of this provision, is a domestic end product (as defined in the clause of this solicitation entitled "Buy American Act--Supplies") and that the offeror has considered components of unknown origin to have been mined, produced, or manufactured outside the United States. The offeror shall list as foreign end products those end products manufactured in the United States that do not qualify as domestic end products.

(2) Foreign End Products:

LINE ITEM NO.	COUNTRY OF ORIGIN
_____	_____
_____	_____
_____	_____

[List as necessary]

(3) The Government will evaluate offers in accordance with the policies and procedures of FAR Part 25.

(g)(1) *Buy American Act -- North American Free Trade Agreement -- Israeli Trade Act Certificate.* (Applies only if the clause at FAR 52.225-3, Buy American Act – North American Free Trade Agreement Israeli Trade Act, is included in this solicitation.)

(i) The offeror certifies that each end product, except those listed in paragraph (g)(1)(ii) or (g)(1)(iii) of this provision, is a domestic end product as defined in the clause of this solicitation entitled "Buy American Act -- North American Free Trade Agreement -- Israeli Trade Act" and that the offeror has considered components of unknown origin to have been mined, produced, or manufactured outside the United States.

(ii) The offeror certifies that the following supplies are NAFTA country end products or Israeli end products as defined in the clause of this solicitation entitled "Buy American Act-North American Free Trade

Agreement-Israeli Trade Act":

NAFTA Country or Israeli End Products:

LINE ITEM NO.	COUNTRY OF ORIGIN

[List as necessary]

(iii) The offeror shall list those supplies that are foreign end products (other than those listed in paragraph (g)(1)(ii) or this provision) as defined in the clause of this solicitation entitled "Buy American Act-North American Free Trade Agreement-Israeli Trade Act." The offeror shall list as other foreign end products those end products manufactured in the United States that do not qualify as domestic end products.

Other Foreign End Products:

LINE ITEM NO.	COUNTRY OF ORIGIN

[List as necessary]

(iv) The Government will evaluate offers in accordance with the policies and procedures of FAR Part 25.

(2) *Buy American Act--North American Free Trade Agreements--Israeli Trade Act Certificate, Alternate I (May 2002)*. If Alternate I to the clause at FAR 52.225-3 is included in this solicitation, substitute the following paragraph (g)(1)(ii) for paragraph (g)(1)(ii) of the basic provision:

(g)(1)(ii) The offeror certifies that the following supplies are Canadian end products as defined in the clause of this solicitation entitled ``Buy American Act--North American Free Trade Agreement--Israeli Trade Act'':

Canadian End Products:

Line Item No.

_____

_____

(List as necessary)

(3) Buy American Act--North American Free Trade Agreements--Israeli Trade Act Certificate, Alternate II (May 2002). If Alternate II to the clause at FAR 52.225-3 is included in this solicitation, substitute the following paragraph (g)(1)(ii) for paragraph (g)(1)(ii) of the basic provision:

(g)(1)(ii) The offeror certifies that the following supplies are Canadian end products or Israeli end products as defined in the clause of this solicitation entitled ``Buy American Act--North American Free Trade Agreement-Israeli Trade Act'':

Canadian or Israeli End Products:

LINE ITEM NO.	COUNTRY OF ORIGIN
_____	_____
_____	_____
_____	_____

[List as necessary]

(4) *Trade Agreements Certificate.* (Applies only if the clause at FAR 52.225-5, Trade Agreements, is included in this solicitation.)

(i) The offeror certifies that each end product, except those listed in paragraph (g)(4)(ii) of this provision, is a U.S.-made, designated country, Caribbean Basin country, or NAFTA country end product, as defined in the clause of this solicitation entitled “Trade Agreements.”

(ii) The offeror shall list as other end products those end products that are not U.S.-made, designated country, Caribbean Basin country, or NAFTA country end products.

Other End Products

LINE ITEM NO.	COUNTRY OF ORIGIN
_____	_____
_____	_____

_____ _____

[List as necessary]

(iii) The Government will evaluate offers in accordance with the policies and procedures of FAR Part 25. For line items subject to the Trade Agreements Act, the Government will evaluate offers of U.S.-made, designated country, Caribbean Basin country, or NAFTA country end products without regard to the restrictions of the Buy American Act. The Government will consider for award only offers of U.S.-made, designated country, Caribbean Basin country, or NAFTA country end products unless the Contracting Officer determines that there are no offers for such products or that the offers for such products are insufficient to fulfill the requirements of the solicitation.

(h) *Certification Regarding Debarment, Suspension or Ineligibility for Award (Executive Order 12549)*. (Applies only if the contract value is expected to exceed the simplified acquisition threshold.) The offeror certifies, to the best of its knowledge and belief, that the offeror and/or any of its principals--

(1) [ ]Are, [ ]are not presently debarred, suspended, proposed for debarment, or declared ineligible for the award of contracts by any Federal agency; and

(2) [ ]Have, [ ]have not, within a three-year period preceding this offer, been convicted of or had a civil judgment rendered against them for: commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a Federal, state or local government contract or subcontract; violation of Federal or state antitrust statutes relating to the submission of offers; or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, tax evasion, or receiving stolen property; and

(3) [ ]Are, [ ]are not presently indicted for, or otherwise criminally or civilly charged by a Government entity with, commission of any of these offenses.

(i) *Certification Regarding Knowledge of Child Labor for Listed End Products (Executive Order 13126). [The Contracting Officer must list in paragraph (i)(1) any end products being acquired under this solicitation that are included in the List of Products Requiring Contractor Certification as to Forced or Indentured Child Labor, unless excluded at 22.1503(b).]*

(1) *Listed End Product*

Listed End Product Listed Countries of Origin:

_____ _____

(2) *Certification. [If the Contracting Officer has identified end products and countries of origin in paragraph (i)(1) of this provision, then the offeror must certify to either (i)(2)(i) or (i)(2)(ii) by checking the appropriate block.]*

[ ] (i)The offeror will not supply any end product listed in paragraph (i)(1) of this provision that was mined, produced, or manufactured in the corresponding country as listed for that product.

[ ](ii) The offeror may supply an end product listed in paragraph (i)(1) of this provision that was mined, produced, or manufactured in the corresponding country as listed for that product. The offeror certifies that is has made a good faith effort to determine whether forced or indentured child labor was used to mine, produce, or manufacture any such end product furnished under this contract. On the basis of those efforts, the offeror certifies that it is not aware of any such use of child labor.

ATTACHMENT 1

ADDENDUM TO FAR CLAUSE 52.212-4

1. NOTICE Listing Contract Clauses Incorporated by Reference

NOTICE:

The following solicitation provisions and/or contract clauses pertinent to this addendum are hereby incorporated by reference:

FEDERAL ACQUISITION REGULATION (48 CFR CHAPTER 1)

NUMBER	DATE	TITLE
52.232-34	MAY 1999	PAYMENT BY ELECTRONIC FUNDS TRANSFER--OTHER THAN CENTRAL CONTRACTOR REGISTRATION

2. EVALUATION OF OPTIONS (FAR 52.217-5) (JUL 1990)

Except when it is determined in accordance with FAR 17.206(b) not to be in the Government's best interests, the Government will evaluate offers for award purposes by adding the total price for all options to the total price for the basic requirements. Evaluation of options will not obligate the Government to exercise the option(s).

3. PERIOD OF PERFORMANCE (EP 52.212-140) (APR 1984)

The period of performance of this contract shall be from award date through One (1) year after award date inclusive of all required reports.

4. TECHNICAL QUESTIONS (EP 52.215-110) (APR 1984)

Offerors must submit all technical questions concerning this solicitation in writing to the contract specialist. EPA must receive the questions no later than **ten (10) calendar days** after the date of this solicitation. EPA will answer questions which may affect offers in an amendment to the solicitation. EPA will not reference the source of the questions.

5. OPTION FOR INCREASED QUANTITY--FIXED-PRICE CONTRACT (EP 52.217-982) (APR 1984)

(a) The Government may increase the quantity of work called for under this contract as follows:

Optional Items:

1. One (1) 2007 Compliant Heated Gaseous Sample Collection Device, in accordance with the Statement of Work.

2. One (1) 2007 Compliant Diesel Particulate Matter Sampler, in accordance with the Statement of Work.

3. One (1) Proportional Ambient Sampling System, in accordance with the Statement of Work.

4. One (1) Toxic Sample Collection System, in accordance with the Statement of Work.

5. Remedial Maintenance One (1) Year after Acceptance through Second Year after Acceptance.

6. Preventive Maintenance One (1) Year after Acceptance through Second Year after Acceptance.

7. Replacement Parts and Equipment One (1) Year after Acceptance through Second Year after Acceptance.

8. Remedial Maintenance Second Year after Acceptance through Third Year after Acceptance.

9. Preventive Maintenance Second Year after Acceptance through Third Year after Acceptance.

10. Replacement Parts and Equipment Second Year after Acceptance through Third Year after Acceptance.

11. Remedial Maintenance Third Year after Acceptance through Fourth Year after Acceptance.

12. Preventive Maintenance Third Year after Acceptance through Fourth Year after Acceptance.

13. Replacement Parts and Equipment Third Year after Acceptance through Fourth Year after Acceptance.

(b) The Contracting Officer may exercise an option by written notice to the Contractor within the following time period:

Optional Item	Time Period for Exercising Option
1	Up to One (1) year after contract award
2	Up to One (1) year after contract award
3	Up to One (1) year after contract award
4	Up to One (1) year after contract award
5	Up to One (1) year after acceptance
6	Up to One (1) year after acceptance

7	Up to One (1) year after acceptance
8	Up to Second year after acceptance
9	Up to Second year after acceptance
10	Up to Second year after acceptance
11	Up to Third year after acceptance
12	Up to Third year after acceptance
13	Up to Third year after acceptance

6. CONTRACT ADMINISTRATION REPRESENTATIVES (EP 52.242-100) (AUG 1984)

Project Officer(s) for this contract:

Project Officer:

TO BE IDENTIFIED AT TIME OF CONTRACT AWARD

Contract Specialist(s) responsible for administering this contract:

Administrative Contracting Officer:

TO BE IDENTIFIED AT TIME OF CONTRACT AWARD

ATTACHMENT 2

STATEMENT OF WORK

Exhaust Emissions Sampling System (CVS) for Heavy Duty Engine Dynamometer Test Cell 2 Statement of Work

Introduction:

The EPA's National Vehicle and Fuel Emission Laboratory (Ann Arbor, Michigan) plans to procure a modern exhaust emissions sampling system. The new sampling system will be installed in EPA's Heavy Duty test cell 2. The emissions sampling system will provide the functions of the constant volume sampler (CVS), as those functions are defined in 40 CFR 86.1310-2007. However, the emissions sampler will have certain enhanced features as described in this statement of work. These features include a low loss dilution tunnel and sample handling system, the direct mass flow measurement of dilution air, constant mass flow operation and proportional ambient sampling. Flow measurement of the dilution air and dilute exhaust will be accomplished by ultrasonic flow meters. The scope of activity in this procurement is to fabricate, deliver, and install the exhaust emissions sampling system.

This capability is needed in order to test low-emission heavy-duty engines equipped with advanced exhaust emission control systems. This capability will be used to support the technology review for the 2007 Heavy-Duty On-highway Emissions Standards, and will also be needed in order to accurately measure gaseous emissions from heavy-duty diesel engines certified to the 2007 Heavy-Duty On-highway Emissions Standards.

Heavy Duty test cell 2 is an engine dynamometer test cell. The test cell is designed to run transient and steady state exhaust emission tests on large engines, primarily diesel. These engines are typically used in on-highway truck applications, or non-road applications such as agricultural equipment. The engines tested in this test cell typically have rated power values from 100 to 600 HP. The testing consists of steady mode operation as well as transient testing simulating a city or highway driving experience. During testing, the exhaust emissions are sampled and measured along with many other parameters including actual engine power output. Finally, emission rates are calculated to yield brake specific results or mass of emissions per unit of engine work. Testing is conducted according to U.S. Federal Standards (40 CFR Part 86, Subpart N) and standards from other international governing bodies.

Overview:

The contractor shall deliver to the EPA an installed, commissioned, and acceptance tested exhaust emissions sampling system. This shall include all systems as described in this statement of work. The contractor is responsible for the removal of all old equipment, the installation of the new system, commissioning, and training of EPA personnel.

In addition, the contractor shall provide complete, detailed schematics of its systems and how the integration of all the systems and physical layout shall be facilitated. The final design shall provide two sets of documentation, including wire lists, color coding, electrical schematics, piping/tubing diagrams, operating manuals and computer system documentation. Operating/repair manuals for all equipment and instrumentation shall be supplied under this contract. Recommended preventative maintenance, spare parts, and warranty provisions shall be provided in writing.

The EPA shall provide the necessary utilities, within 50 feet of the site.

The contractor, at the completion of the installation and commissioning of the exhaust emissions sampling system shall conduct acceptance testing in accordance with the instructions provided later in this statement of work.

Overall Design Goal:
The statement of work is written to allow flexibility of potential solutions to meet the requirements. While there is a certain minimum complexity required to meet the requirements, the preferred solutions are those which are not overly complex. The range of possible applications of the emissions sampler can only be estimated at the present time. The ultimate utility of such a system will depend on how easily it can be adapted to future needs. The design philosophy therefore, should be built on the idea that every part of the system should allow for future changes, re-configuration or upgrades. An overly complex solution or proprietary systems limit the future flexibility.
The goal of this project is for EPA to procure a simple, yet technologically advanced Exhaust Emissions Sampling System (CVS).

System Design Goals:
- Size emissions sampling system to test diesel engines up to 600 HP
- System for a dilute exhaust flow range of 3,000 to 10,000 SCFM
- Sample handling for low loss of particulates and gaseous emissions
- Measure dilution air directly
- Operate system at constant mass flow
- Provide proportional sampling of dilution air

Emissions Sampler Application:
The emissions sampler specification in this statement of work is an incremental improvement of constant volume sampler (CVS) designs that have been used over the past two decades. The CVS method is a common and recognized method for determining engine mass emissions and it draws its strengths from the simplicity of its operations. The functional, simplified description of a CVS is to collect a small sample of dilute exhaust gas and to measure the total volume of that dilute exhaust gas. This information combined with gas concentration, measured by a separate instrument, is all that is necessary to

determine mass emissions. Fundamentally, this process will remain unchanged in this system. The system described here uses some incremental improvements to correct some problems encountered when testing large engines (up to 600 Hp) at low emissions levels. These improvements include better sample handling, and revised flow control and flow measurement methods.

The system description below is presented both from a component function level and from a system function level. All of the components that have been specified here are commercially available. If an offeror is aware of a better product or approach, it is encouraged to suggest these in its proposal.

Ultimately, the contractor shall deliver to the EPA an installed, commissioned, and acceptance tested exhaust emissions sampling system that meets the design and system goals. A Maximum two (2) week on-site commissioning period needs to be allowed for in the contractors proposed schedule. EPA will work jointly with the contractor during the commissioning period to ensure the date is met.

Safety Features:
Certain conditions in the test cell operation at large may require that the emissions sampler be shut down quickly. Controls shall be designed to allow a fast shutdown of the blowers from a dedicated digital input signal supplied from an external source.

Major Systems and Physical Layout:
The emissions sampler is comprised of three major systems.

A Primary Dilution Air Processing
B Primary Dilution Tunnel
C Dilute Exhaust Processing

Each system is described below in detail. The layout of these major systems is similar to designs used by EPA in the past. The layout of the system will be done on two levels. This will include the test cell and a structural mezzanine above the test cell. This saves a great deal of floor space on the main floor. The primary dilution tunnel will be placed in the test cell for close proximity to the test engine. The end of the dilution tunnel will pass through a wall into an equipment room where the sample zone will be located. The mezzanine level will house the dilution air processing and dilute exhaust processing portions of the system.

The equipment must be designed to fit into the space that is available. The room sizes are as follows:

Test cell:	20’ width, ceiling 10’ high
Equipment room:	10’ width (5’ useable width), ceiling 10’ high
Mezzanine:	25’ by 10’ area above the test cell and equipment room, ceiling 93” high to the building steel. There is an additional 4’ of height in the

building steel area, which may be used.

An overall system drawing has been included with this specification to show the spaces relative to each other and one layout design possibility of the emissions sampler.

System Components: Functions & Performance Requirements:

A. Primary Dilution Air Processing

The primary dilution air is the air that is used for dilution of the raw exhaust in the primary dilution tunnel. The dilution air processing consists of filtering, temperature conditioning, and flow rate measurement. As a unit, this system should be designed to fit on the mezzanine level above the test cell.

With a carefully designed system, dilution air can be conditioned and measured with very little pressure drop. The intention of this design is to meet the static pressure depression limits at the exhaust inlet to the dilution tunnel without the need for an additional blower. The static pressure depression limits are given in 40 CFR 86.1309-90(b)(1).

Primary Dilution Air Processing, Assembly Required: 1

The primary dilution air processing is made up of the following components:

One (1) Primary Dilution Air Filtering Assembly
One (1) Primary Dilution Air Temperature Conditioning Assembly
One (1) Primary Dilution Air Flow Meter

This portion of the system shall be designed to fit on the mezzanine level above the test cell. Each component is described in detail below.

Primary Dilution Air Filtering, Assembly Required: 1

- Dilution air shall be filtered with HEPA filters
- HEPA filters shall be standard sized units: 24" x 24" x 12"
- Multiple HEPA filters shall be mounted on a plenum assembly for easy removal and replacement.
- HEPA filter design shall have a minimum particle removal efficiency of 99.97% at 0.3 micron
- The pressure drop across all HEPA filters and plenum assembly shall be less than 1" H_2O at 10, 000 cfm with clean filters.

Primary Dilution Air Temperature Conditioning, Assembly Required: 1

- Dilution air will enter the system from the upper level of the building, near the roof girders.
- There is minimal conditioning of this air. The air temperature can be as high as 35 deg C.
- A water-to-air heat exchanger shall be installed into the system immediately after the HEPA filtering section to provide cooling of the dilution air.
- The heat exchanger shall be a fin-and-tube type with multi-pass tubing for the cooling fluid.
- The heat exchanger shall be designed to operate off of the building chilled water system.
- The chilled water system operates at 5 to 11 deg C.
- Supply and return chilled water lines have a minimum differential pressure of 18 psi.
- Cooling of the dilution air shall be controllable from ambient temperature to 15 deg C.
- The temperature conditioning system shall be capable of controlling dilution air temperature to a set point within + / - 2 deg C. The set point shall be a user selectable value ranging from ambient to 15 deg C.
- The heat exchanger assembly shall have a condensate drain designed into the system and be plumbed to the facility drain.
- The heat exchanger assembly shall be designed for a minimum of pressure loss in the dilution air, yet still allowing it to perform adequately.
- The pressure drop across the heat exchanger assembly shall be less than 1" H_2O at 10, 000 cfm.
- An approximate size heat exchanger for this application is 51" height x 51" width x 8 rows deep and 8 fins per inch.

Primary Dilution Air Flow Meter and Dilute Exhaust Flow Meter, Assembly Required: 1 (each) (see also Dilute Exhaust Processing Section)

Two ultrasonic flow meters are used in the exhaust emissions sampling system. One will measure dilution air flow rate. One will measure dilute exhaust flow rate. The specification below shall apply equally to both flow meters.

While ultrasonic flow meters are relatively new to emission testing applications, some guidance and background are given in SAE, ASME, and NIST technical reports. A partial list of these reports is provided below:

1. Martin Beck and Konrad Hinterhofer, "Direct High Dynamic Flow Measurement in the Exhaust of Combustion Engines," SAE 980880, February, 1998

2. John D. Wright, "The Performance of Transit Time Flowmeters in Heated Gas Mixtures," 1998 ASME Fluids Engineering Division Summer Meeting, Paper No. FEDSM98-5290 Paper available at NIST web site: <http://www.cstl.nist.gov/div836/836.01/Publications.html#Ultrasonic_Flow_Meters>

3. ASME, Fluid Meters Their Theory and Application, 6th Edition, 1971, pages 144 - 145, "Sound and Light Velocity Measurements; gives flow equations.

Flow Meter Specifications:
- Line size: 14" or 16" tube size (see Maximum Flow Velocity discussion below)
- Flowing fluid: 1 part diesel exhaust, 10 parts air, nominal
- Flow range: 3,000 - 10,000 SCFM
- Temperature of Flowing Fluid: 15 - 190 deg C
- Pressure of Flowing Fluid: Less than 1 psi depression from atmospheric
- Accuracy: 0.5% to 1.0%, traceable to NIST
- No obstructions in the flow path.
- Scan rate of data collection: 4 scans per second across the flow stream, minimum.
- Multi-Path or Single Path Ultrasonic Flow Meters
- Ultrasonic Flow Meter shall be an in-line design only.
- Spoolpiece shall be factory designed and built for the application. (Field assembly is unacceptable)
- The dilution air flow meter and dilute exhaust flow meter shall be identical.

Adjoining Plumbing Conditions for Flow Meters:
- 14 " or 16" tube size
- Stainless Steel tube.
- Wall Thickness determined by the flow meter
- Length up to 5 feet

Flanges to Mount the Flow Meter into the System:
- High Pressure Rated Flanges are not necessary due to the pressure requirements are minimal
- Flanges shall be leak tight and able to handle the temperature range.

Maximum Flow Velocity:
- Maximum Flow Velocity occurs at 10,000 SCFM at 190 deg C which is equivalent to approx. 16,000 ACFM.(262 ft/sec for a 14" dia tube size OR 200 ft/ sec for a 16" dia tube size)
- Tube size could be larger if this is too high of a flow velocity. However each flow meter will need ten (10) diameters of straight running tube on the inlet and 5 diameters of straight running tube on the outlet.
- Increasing the tube diameter above 16" may make the overall layout too large for the space available.

Flow Units:
Ultimately, the emissions sampler shall report flow rate data in mass flow units directly. The mass flow

rate shall be a calculated value using the reported mean gas velocity data from the flow meters, cross sectional area at the flow meter, and measured gas pressure and temperature data . As discussed under Real Time Calculations below, the calculation of dilute exhaust flow rate requires the additional measurement of oxygen concentration and water vapor concentration. Specifications for these sensors are given below.

- Pressure and Temperature sensors may be either integrally mounted with the flow meter or they may be mounted externally to the flow meter in the vicinity of the flow meter.
- Pressure and Temperature sensors shall meet the requirements of 40 CFR 86.1310-2007
- The calculations for gas density and molecular weight are described below in the System Integration section.
- Gas density may alternatively be measured with a continuously reporting gas densitometer.
- The density value shall be selectable by the operator, and shall be either a constant value or a continuously updated calculated value.

Oxygen Sensor Specification, Assembly Required: 1

- Sensor shall be a stand-alone "in-situ" type, not requiring a sample pump, etc.
- Sensor shall be installed in the vicinity of the dilute exhaust flow meter
- Sensor shall be a zirconia- based UEGO (Universal Exhaust Gas Oxygen) type, with wide range measurement capability.
- Range: 0.00% to 22.00% O2 minimum
- Resolution: 0.01% O2
- Precision: +-0.02% O2 or 2% of point, whichever is greater over the full range
- Response time: T-90=100 milliseconds to an 80% full scale upward step change in %O2, T-10=200 milliseconds to an 80% full scale downward step change in %O2.
- Output: 0-10VDC or 4-20mA linearly proportional to %O2. Non-linear output signals are not acceptable.

Water Vapor Sensor Specification, Assembly Required: 1

- Sensor shall be a stand-alone "in-situ" type, not requiring a sample pump, etc.
- Sensor shall be installed in the vicinity of the dilute exhaust flow meter
- Measurement range 0 - 100 %RH
- Accuracy: +/- 2 %RH (0 - 90 %RH), +/- 3 %RH (90 - 100 %RH)
- Operating temperature: - 40 to 180 deg C
- Outputs shall be calculated dewpoint temperature and absolute humidity, minimum
- Output signals: 0-10VDC or 4-20mA linearly proportional to variable selected.

Preparation of the flow stream for ultrasonic flow meter use:

- Ultrasonic flow meters are sensitive to the inlet and exit flow stream patterns.
- Inlet flow stream should be a fully developed turbulent velocity profile ('pipe flow').

- Exit flow stream should not have unusual flow disturbances either.
- Straight running tube shall be installed for a minimum of ten (10) diameters (minimum) of straight running tube before the flow meters
- Five (5) diameters of straight running tube downstream of the flow meters.
- A velocity profile correction plate shall be installed in the inlet piping of each flow meter to further promote the fast formation of 'pipe flow'.

Velocity profile correction plate:
- Velocity profile correction plate is designed to break up unusual flow patterns and quickly restore 'pipe flow'.
- Designs for such units are described in ASME research reports and some are available commercially.
- The plate is a series of orifice openings, which are sized in an appropriate gradient to initiate the correct fluid velocity as a function of radial distance into the flow stream.
- The plate shall be designed for a minimum of pressure loss, yet still allowing it to perform adequately.
- Since this application does not require high pressures, the velocity profile correction plate may be fabricated on a milling machine with thin plate stainless steel.

Calibration of the Ultrasonic Flow Meters:
- Each ultrasonic flow meter shall be provided with a flow calibration traceable to NIST.
- Calibration shall cover the flow range of 3,000 to 10,000 SCFM at ambient pressure, and ambient temperature levels.
- Each flow meter shall be calibrated with its accompanying inlet and exit piping and velocity profile correction plate installed.
- Each flow meter shall be calibrated as an assembly with the piping configuration that will be installed in the emissions sampler.

B. Primary Dilution Tunnel

Overview of the Primary Dilution Tunnel

The primary dilution tunnel is the central device used in the emission sampling system. Its main function is to uniformly mix raw engine exhaust and dilution air and prepares this mixture to be sampled. The design of the primary dilution tunnel will ultimately control two other important processes. These are the ability to preserve the mixture in its original state and the ability to control pulsations generated by the test engine. The systems described below are the pulsation isolator, the pulsation dampner, the mixing tee, the membrane and solid tubing sections, and the sample zone. The pulsation isolator, prevents pulsations generated by the test engine from disturbing the dilution air flow meter. The mixing

tee is where raw engine exhaust is introduced into the dilution air. This mixture, called dilute exhaust, travels through the primary dilution tunnel. The tubing sections of the primary dilution tunnel will have either membrane wall tubing or solid wall tubing. Finally, the dilute exhaust enters the sample zone where it is sampled. The functions and requirements of these components are described in detail below.

The primary dilution tunnel shall meet the requirements of 40 CFR 86.1310-2007, paragraph 4.

These requirements are restated here:

(4) Primary-dilution tunnel.

(i) The primary dilution tunnel shall be:

(A) Small enough in diameter to cause turbulent flow (Reynolds Number greater than 4000) and of sufficient length to cause complete mixing of the exhaust and dilution air. Good engineering judgment shall dictate the use of mixing plates and mixing orifices to ensure a well- mixed sample. To verify mixing, EPA recommends flowing a tracer gas (i.e. propane or CO2) from the raw exhaust inlet of the dilution tunnel and measuring its concentration at several points along the axial plane at the sample probe. Tracer gas concentrations should remain nearly constant (i.e. within 2%) between all of these points.

(B) At least 8 inches (20 cm) in diameter.

(C) Constructed of electrically conductive material which does not react with the exhaust components.

(D) Electrically grounded.

(E) EPA recommends that the tunnel should have minimal thermal capacitance such that the temperature of the walls tracks with the temperature of the diluted exhaust.

(ii) The temperature of the diluted exhaust stream inside of the primary dilution tunnel shall be sufficient to prevent water condensation.

(iii) The engine exhaust shall be directed downstream at the point where it is introduced into the primary dilution tunnel.

Additional Requirements:

The primary dilution tunnel shall have the following additional features:

- Effective acoustic damping elements to eliminate or drastically reduce pressure pulsations that are generated from the test engine. Control of pressure pulsations is necessary for accurate flow measurement and will enhance the ability to control steady flow rates.

- A small portion of dilution air will flow through a porous membrane wall into the dilution tunnel. This will prevent the classical problem of thermophoretic deposition of particles to the tunnel wall.

- The mixing tee will feature a velocity profile correction plate at the inlet. This is used to enhance mixing of exhaust and dilution air.

- A flow controller will allow the emissions sampler to operate at constant mass flow, even while operating modes of the test engine are changed. (Covered in System Integration section).

The primary dilution tunnel is designed to allow the functions described above in a packaging arrangement that is similar to designs used by EPA in the past. The design must also allow for future reconfiguration of the tunnel to meet changing needs. As a unit, this portion of the system shall be designed to fit into the test cell and adjoining equipment room.

Primary Dilution Air Pulsation Isolator and Dilute Exhaust Pulsation Dampner, Assembly Required: 1 (each) (see also Dilute Exhaust Processing Section)

Two pulsation control devices shall be used in the exhaust emissions sampling system. One (1) will prevent pressure pulsations from disturbing flow measurements of the dilution air and the second will attenuate pressure pulsations before they reach the dilute exhaust flow meter. The specification below applies equally to both pulsation control devices. However, the two devices do not need to be identical.

Pulsation Control Devices Requirement:

The primary dilution air pulsation isolator must:

- Prevent or drastically reduce any pressure pulsations generated from the test engine from traveling upstream to the dilution air flow meter.
- Turn the air flow coming in from the dilution air processing unit and prepare a favorable velocity profile for entry into the primary dilution tunnel.
- The pulsation isolator may also serve as an inlet plenum for the bypass booster blower.

The dilute exhaust pulsation dampner must:

- Prevent or drastically reduce any pressure pulsations generated from the test engine from traveling downstream to the dilute exhaust flow meter.
- Turn the air flow coming in from the tunnel.

Both pulsation control devices:

- May be multi-segmented or multi-piece units.

- Shall be leak tight
- Shall have minimum pressure loss, while still allowing adequate performance
- Shall be designed to produce a smooth, non-pulsating, flow stream.
- Shall eliminate or drastically reduce pressure pulsations above 50 Hz.
  (Most pulsations generated by the test engine are in the range of 400 - 800 Hz)

Guidance on pulsation control devices are given in SAE, ASME, NASA, and other technical reports. A partial list of these reports is provided below:

1. "Measurement of Intake Air or Exhaust Gas Flow of Diesel Engines," SAE Surface Vehicle Recommended Practice, SAE J244, August 1992.

2. A.K. Oppenheim and E.G. Chilton, "Pulsating-Flow Measurement - A Literature Survey," Transactions of the ASME, Paper No. 53-A-157, February, 1955.

3. D.D. Davis, Jr., Et. Al., "Theoretical and Experimental Investigation of Mufflers with Comments on Engine-Exhaust Muffler Design," NASA Technical Report 1192, October, 1952.

Primary Dilution Tunnel, Assembly Required: 1

The primary dilution tunnel is made up of the following components:

One (1) Mixing Tee
Two (2) Membrane Tubing Sections
Two (2) Solid Tubing Sections
One (1) Sample Zone

This portion of the system shall be designed to fit in the test cell. Each component is described in detail below. The initial installed configuration of the primary dilution tunnel will be one (1) mixing tee, two (2) membrane tubing sections, one (1) solid tubing section, and one (1) sample zone. Therefore, one (1) solid tubing section will not be installed initially, but just supplied loose.

General Requirements that Apply to All Tubing Pieces of the Primary Dilution Tunnel:

- All tubing pieces shall be 24" OD tube size, wall thickness 00625", material: 316 stainless steel.
- All plumbing that comes in contact with dilute exhaust shall be of 316 stainless steel or Teflon tubing construction only.
- Each section of tunnel tubing shall be fitted with bolt style flanges on each end and shall include a gasket designed into the flange.

- All flanges shall be leak tight and provide a smooth inside surface that will not disrupt the flow pattern inside the tunnel.
- Flanges shall be leak tight over the temperature range of 15 - 190 deg C.
- When the entire tunnel is assembled, all pieces shall be electrically connected and conductive either through the mechanical connections of the flanges or by a separate ground strap wiring to each piece. A ground strap shall be provided for connection to the facility ground. All ground strap cable shall be ½" braided copper ground strap, minimum. Minimum lead wire shall be 50' for connection to a facility ground.
- Sample ports shall be installed in the tunnel every 24" from the raw exhaust exit to the sample zone.
- Four (4) ports shall be installed at 90 degrees around the circumference and this pattern shall be repeated at every 24" increment of tunnel length. Each port shall be a ½" pipe boss cut in half and welded to the tunnel wall. The center shall be drilled out for a 3/8" clearance hole.

Mixing Tee, Assembly Required: 1

The function of the mixing tee is to introduce the raw exhaust into the dilution air. The raw exhaust is piped in through the tunnel wall and turned with an elbow in order to discharge into the center of the flow stream in the tunnel. A velocity profile correction plate is used just prior to the elbow to accelerate the formation of a fully turbulent velocity profile in the tunnel. Fully turbulent flow or "pipe flow" makes very favorable conditions for mixing the exhaust and dilution air. The mixing process must be complete before the gases reach the sample zone.

Mixing Tee Requirements:

- Section of tubing that is 36" long
- Solid tubing with flanges as defined above.
- Velocity profile correction plate shall be installed at the inlet of this piece.
- Velocity profile correction plate is identical to that described above under the flow meter specifications.
- Engine exhaust shall be brought into the tunnel through a 6" OD double wall elbow, made of stainless steel.
- Inner tube of this unit shall have an OD of 6" so it will match with existing 6"OD tube used for exhaust plumbing.
- Outer tube of the elbow shall allow for a ¼" air space between the tubes (radial direction).
- Air space shall be completely sealed, by welding the outer tube to the inner tube at the ends.
- Inside the tunnel the elbow shall be terminated with a plain end with no protrusions or obstructions in the inner pipe ID.
- Outside the tunnel, the inner pipe shall be brought out 4" with a single wall pipe and terminated with a 6" Marman flange.
- Double wall elbow shall be welded into place in the mixing tee tubing section.

- Double wall elbow discharge end shall be located at the end of the mixing tee tubing section.
- Elbow discharge end shall be concentric with the mixing tee tubing section and facing downstream.

Membrane Tubing Sections, Assembly Required: 2

The function of the membrane tubing sections is to prevent thermophoretic deposition of particles (exhaust particulate matter) on the tunnel wall. This is accomplished by flowing a small portion of the dilution air through a sintered metal or porous tunnel wall section. The air velocity must be sufficient to overcome the natural driving force of the particles to follow a strong temperature gradient (decreasing in this case) and attach to the tunnel wall.

Membrane Tubing Section Requirements:

- Each membrane tubing section shall be 52" long.
- Each tubing section shall be of double wall construction.
- Inner wall shall be a sintered metal membrane, stainless steel, 24" OD nominal, wall thickness 1/8", pore size of 40 micron.
- Inside diameter shall exactly match the inside diameter of the solid tubing sections.
- Outer wall of the tube shall be 30"OD stainless steel tubing, wall thickness 0.0625".
- Flanges shall be installed as described above.
- Space between the inner and outer wall will create a "plenum" area, which will supply air pressure evenly to the entire membrane surface.
- Plenum area shall be divided into two discrete spaces by a separator ring located at the center of the tubing section.
- Separator ring shall be installed to make two separate airtight plenums in each tube section.
- Each plenum shall have an access port installed, nominally 2" diameter.
- Each port shall be connected to a leak tight shutoff valve and a pressure regulator, then terminated in a leak tight connection for a 2" flexible supply hose.
- A diffuser shall be installed on the inside of the outer wall and covering the opening where the air enters the plenum area.
- Diffuser shall turn the air flow direction so that it is moving around the circumference of the plenum and therefore the air flow will not be directed at the membrane material as it enters the plenum area.
- Pressure in each plenum area shall be individually controllable from 1"H_20 to 10"H_20.

Solid Tubing Section, Assembly Required: 2

Solid Tubing Section Requirements:

- Each solid tubing section shall be 52" long.
- Each tubing section shall be constructed of 24" OD tubing size, 316 stainless steel, wall thickness 0.0625".

- Flanges shall be installed as described above.

Sample Zone, Assembly Required: 1

The sample zone is where samples are collected from the dilute exhaust gas mixture. It is a point where the raw exhaust and dilution air are well mixed. The samples taken at this point are considered representative of the entire mixture. The type of analyses done on samples collected at this point include, but are not limited to: continuous hot gaseous sampling (HC, Nox), particulate matter sampling, toxics sampling, FTIR sampling, and hot or cold batch collection gaseous samples (HC, Nox, CO, CO2). These analyses are described to aid in understanding how the system will be used, the analysis itself is not part of this contract.

Sample Zone Requirements:

- Sample zone shall be an elbow piping section, and shall comprise the final 60" of primary dilution tunnel length.
- Flanges shall be installed as described above.
- Temperature of the dilute exhaust gas mixture in the sample zone must never exceed 191 deg. C.
- Temperature data shall always be monitored in this area during operation.
- Sample zone shall be located 180" from the end of the raw exhaust elbow.
- Sample zone shall include four sanitary style leak tight ports.
- Each port shall be 6" in diameter.
- Each port shall be supplied with a blank plate, clamp and flange.
- Two (2) of the ports shall be located at the middle of each side of the tunnel at the sample zone, one (1) on each side.
- Remaining two (2) ports shall be equally spaced below the first two (2) ports on the lower half of the tunnel.

Bypass Booster Blower, Assembly Required: 1

A bypass booster blower will take a portion of the dilution air and supply it under pressure to the membrane tubing sections in the primary tunnel.

Bypass Booster Blower Requirements:

- Bypass booster blower shall take a portion of the dilution air and supply it under pressure to all membrane tubing sections installed in the primary tunnel.
- Air shall be introduced into the tunnel through the membrane tubing sections in a controlled fashion.
- Bypass blower system shall provide airtight handling of dilution air.
- Blower shall provide a variable flow rate with a maximum flow rate of 1200 SCFM at 20" H_2O pressure above atmospheric.

- Blower shall be leak tight and shall not introduce hydrocarbon vapors into the flow stream.
- Blower shall be operated from a variable frequency drive to control blower speed.
- Variable frequency drive shall be controlled either manually or automatically.
- Manual control shall consist of user controls to set any fixed flow rate.
- Automatic controls shall use a control feedback loop to maintain a set output pressure.

C. Dilute Exhaust Processing

Following the dilution tunnel, the mixture of air and engine exhaust must next be measured for mass flow rate. This is done in the dilute exhaust processing portion of the emission sampler. This portion of the emission sampler needs to be designed to handle the very unique difficulties of measuring engine exhaust.

- The measurement of dilute exhaust shall take into account the following factors:
    - Gas stream is hot, up to 191 deg C.
    - Gas steam is potentially dirty and acidic. It contains diesel particulate.
    - Flow rate is unsteady, by nature of the pressure pulsations, which are generated by the test engine.
    - Molecular weight of the gas stream changes depending on the test and the test engine.

Dilute Exhaust Processing, Assembly Required: 1

The dilute exhaust processing assembly is made up of the following components:

One (1) Dilute Exhaust Pulsation Dampner
One (1) Dilute Exhaust Flow Meter
One (1) Primary Blower

This portion of the system shall be designed to fit on the mezzanine level above the test cell. Each component is described in detail below.

Dilute Exhaust Pulsation Dampner, Assembly Required: 1

- Specifications for the dilute exhaust pulsation dampner are described above under Primary Dilution Tunnel, Primary Dilution Air Pulsation Isolator and Dilute Exhaust Pulsation Dampner.

Dilute Exhaust Flow Meter, Assembly Required: 1

- Specifications for the dilute exhaust flow meter are described above under Dilution Air Processing, Primary Dilution Air Flow Meter and Dilute Exhaust Flow Meter.

Primary Blower, Assembly Required: 1

The blower for this application needs to provide adequate flow rate capacity and provide a steady flow rate control. If the emissions sampler is designed carefully, the pressure losses through the system should be very minimal. Every component of the system is designed for low pressure loss and therefore this will ease the burden on the blower capacity considerably.

Primary Blower Requirement:

- Blower shall be an industrial exhauster type.
- Blower shall be a variable speed type supplied with a variable frequency power drive and a motor designed for use with a variable frequency drive.
- Blower shall be designed for a flow range of 3000 to 10000 SCFM.
- Blower shall be designed for a minimum inlet pressure depression of 15" H_2O.
- Blower shall be designed for an inlet gas temperature range of 15 deg C to 190 deg C.
- A variable flow restrictor shall be supplied on the inlet of the blower to improve the ability of the blower and control steady flow rates over the range of flows to be controlled.
- A shaft encoder shall be supplied to measure motor speed to improve the ability of the blower motor to operate at steady speeds.
- Encoder signal shall be supplied as a feedback signal to the variable frequency power drive.
- Blower and motor shall be mounted on a unitary base and shall be supplied assembled and tested as a complete unit.
- Sound pressure at 5.0 feet from the blower shall not exceed 98 dBA in all operating modes.
- Blower impeller shall be designed to handle dirty gas streams and operate so that there is little or no build up of dirt on the impeller blades.
- Blower and motor drive system shall be able to control flow rate to a constant flow rate set point and be able to control actual flow rate to +/- 100 CFM of that set point.
- Blower shall be operated from a variable frequency drive to control blower speed.
- Variable frequency drive shall be controlled either manually or automatically.
- Manual control shall consist of user controls to set any fixed blower speed.
- Automatic controls shall use a control feedback loop to maintain a constant mass flow rate in the primary dilution tunnel.
- Control feedback loop shall use the measured tunnel mass flow rate as the real time measure and variable to control.
- Control loop shall use the motor shaft encoder and the inlet vane restrictor to enhance the steady flow rate control in the primary tunnel.
- Bleed air may be introduced at the blower inlet to enhance the steady flow rate control in the lower ranges.
- Controller for the blower speed shall be designed so that any failure of an input data signal or a failure of the controller itself shall not cause unsafe operation of the blower.
- If a failure occurs in the controller during blower operation, the blower shall be shut down in

an orderly manner.
- Controller shall issue an alarm signal upon any blower or blower controller failure.

Note about blower sizing:

Most blowers are rated in volumetric flow rate units. The flow rate unit is typically the CFM. The CFM unit is typically referenced to a temperature near ambient temperature. In this application, the blower rating is given in SCFM. For situations where the temperatures are near ambient levels there is little difference between CFM and SCFM. However, for elevated temperatures, which are expected to occur in this application, CFM and SCFM are quite different. As an example, for a gas stream flowing at 10,000 SCFM, and at temperature of 190 deg C, this equates to approximately 16,000 CFM. This is important to consider in selecting the correct blower size.

System Integration:

The ability to control all system functions from a central control rack is vitally important. All functions of the system shall be controllable through a central control rack.

Central Control Rack, Assembly Required: 1

The central control rack requirements:

Data Logging and Control:
- Monitoring of dilution air filter pressure drop and over pressure limit status
- Monitoring and control of the dilution air heat exchanger
- Monitoring and calculation of flow meter data to determine mass flow rate of dilution air and dilute exhaust
- Means of implementing flow calibrations for flow meters and calibrations for sensors
- Monitor tunnel temperatures
- Control booster blower and monitor booster supply pressure
- Control primary blower and monitor inlet gas temperature and inlet depression
- Emissions sampler shall have both analog outputs and digital communication outputs
- Analog outputs shall be provided for both flow meters, mass flow rate
- All data shall be capable of being serving out over high-speed digital communication data format.
- Provide for data inputs from external test equipment or sensors. Data from the emissions analyzer shall be acquired as an input.
- Control system shall have the capability for future expansion, adaptation, and enhancements
- System design shall enable the adoption of new measurement methods without extensive

renovation or rebuilding of the basic systems

Real Time Calculations:

The emissions sampler shall report the final mass flow rate for both ultrasonic flow meters. The final mass flow rate shall include the effects of pressure and temperature, and represent the true properties of the gas mixtures in real time.

- For calculation of dilution air mass flow rate, the molecular weight of the dilution air shall be a constant value and that value shall be selectable by the operator. Ideal gas conditions may be assumed.
- For calculation of dilute exhaust mass flow rate, the gas density calculation method shall be selectable by the operator and shall be either a constant molecular weight with ideal gas conditions or a real time calculated value based on measured constituents of the mixture.
- In the fixed molecular weight mode, the value used for molecular weight shall be selectable by the operator.
- In the real time calculated mode, the value of dilute exhaust gas density shall be determined according to the technical report listed below:

> *"Calculating the Density and Viscosity of Multi-Component Gas Mixtures", by John D. Wright, NIST, Process Measurement Division, Fluid Flow Group, December, 1995, internal NIST report.*

- To implement this method, measured values of pressure, temperature, oxygen, water vapor, and carbon dioxide must be known.
- FYI, Carbon dioxide data is currently supplied via a HORIBA MEXA gas analyzer, model 7200 DLE.
- FYI, Data output from the MEXA analyzer is supplied by a LAN connection.
- Emissions sampler will need a software driver to poll the emissions analyzer for data.
- Electrochemical sensors shall be installed in the vicinity of the dilute exhaust flow meter to measure oxygen concentration and water vapor concentration. The specifications for these sensors are listed with the flow meter specifications.
- Pressure and temperature data are from the sensors in, or in the vicinity of, the ultrasonic flow meters.
- Calculated molecular weight, densities, and mass flow rates for each flow meter shall be updated at a minimum of four (4) Hz.
- Calculations shall include engine exhaust flow rate and dilution ratio, updated at four (4) Hz.
- Emissions sampler shall totalize the dilution air flow rate data and dilute exhaust flow rate data to determine the total volume of each at standard conditions over each phase of the emissions test.

Flow Control of the Emissions Sampler:

- Central control rack shall provide the ability to monitor and control the mass flow rate of the dilute exhaust in the primary dilution tunnel.
- Controller shall either maintain a constant speed setting of the primary blower or maintain a constant mass flow of dilute exhaust by trimming the blower speed and other control devices.
- Magnitudes and methods used to change, vary, and measure the flow rate shall be automated and configured in a manner that provides optimum accuracy, repeatability, and reliability.
- Control algorithm and the performance of the primary blower system shall produce a steady flow of dilute exhaust.
- Dilute exhaust shall be steady to within 100 SCFM of the setpoint.
- Setpoint shall be selectable by the user manually or be selectable by the host computer.
- Setpoint range shall be 3,000 - 10,000 SCFM of dilute exhaust.

Operational Mode Requirements:

Local Control Mode:

Local control means the function can be selected and controlled by the operator. Local control functions shall include:

a. Power On/Off
b. Local and automatic control
c. Visual Screen
d. Other functions as necessary

- All displays shall be configured in hardware or on the display screen such that the required significant digits of resolution can be set for all measurements.
- Any alarm or warning that can affect safety or test validity shall provide a contact closure.

Host Control Mode:

- Emissions sampling system shall be operable by a host computer system.
- Host control mode shall control all functions.
- System shall send information to the host including, but not limited to: those items listed above.
- Communication between the emission sampler and the host shall be by high speed data transfer link.

Interface Between the Emissions Sampling System and a Host Computer:

- Emissions sampling system shall have the ability to communicate using a high speed network interface with a remote host system.
- IEEE-488, RS-485, and RS-422 w/Ethernet are acceptable protocols.

- Emissions sampling system shall exchange all necessary information, including commands, data, error messages, and reports with the host computer system.
- Control system shall be operational in a host control mode with minimal interaction by the operator.
- In this mode, any test data or commands that must be entered to configure the control system for a test may be accessed from the remote host computer instead of from the control system's input devices, such as keyboard, keypad, or mouse.

General Specifications:

Ambient Conditions:

- Equipment located in the test cell may be exposed to the following ambient conditions:
  - Temperature: 50 to +110 deg F
  - Specific humidity: 20 to 150 grains per lb
  - Altitude: up to 3,300 feet
- Equipment located on the mezzanine level above the test cell may be exposed to the following ambient conditions:
  - Temperature: 30 to +110 deg F
  - Specific humidity: 20 to 150 grains per lb
- All system components shall be designed to operate over the complete range of ambient conditions expected (as defined above).
- The contractor shall ensure that equipment performance will not be affected by the conditions applied to the engine test environment.
- The objective is to maintain measurement stability and to minimize component exposure to adverse conditions.

Electrical Specifications:

- EPA shall provide the following utilities to be used by the contractor for installation purposes:
  - All required electrical power within 50 feet
  - Ample air supply at 50 gr/lb and 68-86 deg F and exhaust for the test cell
  - Concrete floors (may have some slope for drainage)
  - Toxic gas alarms, fire detection and suppression, and facility control
- Contractor shall ensure installation conforms to the latest edition of the National Electric Code (NEC), the National Fire Protection Association (NFPA), and the Building Officials Code Administrators International (BOCA).
- All equipment installed in the test cell must meet the explosion-proof requirement of Class 1, Division 2, and Group D category. Flammable gas or vapor may be present in the test cell.
- Equipment installed on the mezzanine level does not have to meet the explosion-proof

requirement.

Working On-Site at EPA NVFEL:

General Requirements:

- Any work on-site must be scheduled in advance at the convenience of the Government.
- Work on-site which would render Test Cell 2 inoperable needs to be scheduled to occur in the 60 day on-site work period as discussed below.
- Test Cell 2 downtime shall be minimized.
- Contractors working on site at the NVFEL shall observe NVFEL safety policy and shall be escorted by one EPA employee at all times.

Project Schedule and Engineering Requirements:

General:

- Maximum Term of Performance shall be one year from contract issuance.

After contract award:

- Contractor shall update the Project Schedule monthly.
- Contractor will develop system design specifications for the emissions sampling system based on this statement of work.
- Design specifications shall include physical layout, process diagrams, and mechanical and electrical diagrams as appropriate for system components.
- The contractor and EPA personnel will meet at the contractor's site to review system design specifications. EPA personnel will provide comments and feedback during the meeting and in writing within 7 calendar days
- The contractor shall allow for revisions to the system design based upon EPA's review.
- A final design must be submitted to the EPA Project Officer for approval, prior to assembly or build-up of the system. The final design shall be submitted to the EPA Project Officer no more than 120 days after contract award.
- Upon approval of the design, the contractor shall begin assembly or build-up of as much as can be accomplished either at the contractor's facility or at the EPA NVFEL without disrupting the activities of Test Cell 2. Where possible, sub-systems shall be tested independently by the contractor to verify operation as per the design specifications. Flow meter calibrations should be completed at this time. Controls should be assembled and tested at this time. Modifications may be made to correct for any deficiencies uncovered during this process. EPA personnel should be kept informed during this process.

- A final pre-shipment meeting between the contractor and EPA personnel shall be held at the contractors facility. EPA personnel will provide comments and feedback during the meeting and in writing within 7 calendar days.
- The pre-shipment meeting shall review system status and findings during the assembly and build-up activity. This meeting will verify that all systems are present at the contractor's facility, assembled to the extent possible, and ready to be shipped to the EPA NVFEL. The meeting will also verify that the contractor has adequate personnel ready to begin work at the EPA NVFEL at the start of the 60 day on-site work period. (See below).
- The pre-shipment meeting shall be held no more than 210 days after contract award.
- The contractor shall allow for revisions to system assemblies based on EPA's review.
- Upon completion of assembly and build up, the contractor shall request approval of the EPA Project Officer to ship all equipment to the EPA NVFEL. The contractor shall accept full responsibility for any equipment , supplies, or materials shipped to EPA NVFEL prior to Government approval. The request for shipment shall be received no more than 240 days after contract award.
- Upon completion of assembly and build-up, EPA personnel will schedule a time when EPA on-site activities can begin. This date will be no more than 290 days after contract award.
- Once a date is determined to begin EPA on-site activities, the contractor shall complete the demolition, installation, commissioning, and acceptance testing within 60 days of that date. (EPA review of acceptance test results is not included in 60 day period).
- EPA personnel will review acceptance testing results and notify the contractor in writing as to their approval within 7 calendar days after the receipt of acceptance testing results.
- EPA may waive requirement for meetings if alternate means or data are available to verify performance and compliance with the Statement of Work.

Demolition:

- Contractor shall remove the existing tunnel, ductwork, blower, and disconnect all existing equipment from electrical service
- EPA will be responsible for the disposition of all equipment removed.
- Contractor shall prepare Test Cell 2 area for installation once demolition is complete.

Installation:

- Contractor shall install emissions sampling system.
- Contractor shall begin installation of the new equipment following demolition.
- Contractor is responsible for connection and interconnection of the new equipment to

electrical service.
- EPA will place the blower and other large units onto the mezzanine level.

Commissioning:

- Contractor must provide all necessary start-up support to commission the emission sampling system.
- Contractor shall take no longer than two (2) weeks to complete on-site commissioning.
- Commissioning shall include verification of installation, wiring connections, initial power up, initial set-up of user definable parameters, exercise system and system performance.

Acceptance Testing:

- Contractor shall conduct acceptance testing of the completed system on-site at the EPA facility.
- EPA may waive specific testing if alternative means or data are available to verify performance and compliance with the Statement of Work.
- Contractor shall submit a final report to the EPA Project Officer documenting the results of each performance test specified below within fifteen (15) days of completion.

Flow Metering and Flow Control Performance:
- Demonstrate the flow calibration accuracy, traceability, and repeatability.
- Identify the parameters involved in the control of the blowers with respect to their range and response.

Data Monitoring and Control:
- Performance of the systems shall be verified.
- Operator interface and control capabilities shall be tested to confirm that all functions perform as specified in the Statement of Work.

Component Review and Verification:
- Calibration data shall establish and document NIST traceability.

Dilution Air Processing:
- Operational aspects of the temperature control, and flow rate measurement shall be demonstrated under static and engine test conditions.
- Tailpipe pressure shall be verified by use of an independent transducer connected

directly at the tailpipe exit plane.

Flow Measurement Systems:

- Flow measurement system calibrations shall be verified.
- The total system shall be verified by the use of independent flow meters or gas injection and mass recovery techniques.
- Any failures to meet the accuracy or repeatability specifications shall be resolved by the contractor.
- RTD response time of 100 ms shall be substantiated by contractor data from the hot oil bath test or independently by submerging the probe into ice water.

Mixing Performance of the Primary Dilution Tunnel:

- Contractor shall test and demonstrate that the primary dilution tunnel will adequately and rapidly mix gases shall be tested and demonstrated.
- A known quantity of CO2 / N2 gas shall be injected into the raw exhaust port. The dilution of CO2 / N2 in the primary dilution tunnel shall be measured at each tunnel sampling port (every 24").
- Tunnel measurements shall consist of a traverse across the tunnel in both a horizontal and vertical direction to measure concentration.
- The EPA will supply a CO2 analyzer for these measurements.
- Complete mixing shall be demonstrated in the gas stream by the time it reaches the sample zone.
- A test plan will be developed jointly between the contractor and EPA to perform these tests.

Verification of Electrochemical Sensors:

- Sensors used to measure oxygen concentration and water vapor concentration shall be verified for proper operation.
- Known quantities of these gases shall be injected into the system and the resulting sensor values shall be reported.
- Measured and known quantities shall be compared for consistency and accuracy.

Training:

After the exhaust emissions sampling system has been commissioned and acceptance tests have been completed on all systems:

- Contractor shall provide User and System Training
- Contractor shall provide at least sixteen (16) hours of basic training for up to eight (8) people and eight (8) hours of advanced training and systems administration for up to four (4) people.

- Training shall be conducted on the installed system at NVFEL or at a mutually acceptable location.
- Training shall be completed within 30 days after the system has been commissioned.

Warranty:

- Contractor shall warranty all parts, labor, control systems, and equipment for one year.
- Repair service and spare parts shall be available within three working days of request during the one year warranty period.

Spare Parts:

- Contractor shall provide one (1) complete set of recommended on-hand spare parts at the time of installation that will ensure reliable overall operation of the complete system.
- Contractor shall provide one (1) extra set of sensors that are subject to damage or failure during testing.

Documentation:

- Contractor shall provide three (3) copies of the documentation upon installation of the exhaust emissions sampling system.
- Contractor shall provide three (3) copies of an operation manual that includes complete information on system functions, capabilities, user interface, and operation procedures.
- Contractor shall submit detailed instructions and documentation through training videos, demo disks, or CDs.
- Documentation shall be in the English language.
- Documentation shall include the following, at a minimum:
    - Mechanical layout
    - Schematics of all pneumatic and hydraulic components
    - Schematics of all auxiliary systems and components
    - Technical and operational manual(s) for all the components that are used
    - Color coded and/or numbered schematics and wiring lists of all electric components
    - Technical and operational manual(s), including a complete description of the system's control algorithms, performance measures, calibration procedures, system hardware and software operation, and response characteristics
    - Complete Parts list(s) including the following:
        - Address, Phone Number(s), and Point(s) of Contact for all subcontractors' and vendor component parts

- Model and/or part number designations of all component parts
- Recommended, on-hand, spare parts list
- Maintenance and calibration instructions

OPTIONS: EQUIPMENT

Option 1:
2007 Compliant Heated Gaseous Sample Collection Device, Assembly Required: 1

SPECIFICATION

The following is from 40 CFR 86.1310-2007(b)(2):

(2) Heated proportional bag sampling systems. If a heated (191 +/- 11 deg. C) proportional bag sampling system is used for THC measurement, sample bags must demonstrate minimal outgassing and permeability by passing the following performance test:

(i) Performance test for sample bag HC outgassing and CO2 permeability. Bring the bag system to its operational temperature. Fill the heated sample bag with a nominal mixture of 1%CO2 in N2. Perform an initial measurement of CO2 and THC from the sample bag, and repeat the measurement after one hour. Acceptable performance criteria are less than 2% decrease of the initial CO2 reading and less than 1 ppmC THC.

The term sample storage device and "bag" are used interchangeably in this specification to highlight the fact that other types of containers which provide an inert volume of minimal dead volume for sample collection may be comparable and equivalent to the traditional Tedlar bag. Tedlar may induce unwanted HC outgassing. The objective is to minimize any chemical interaction, particularly at very low concentration levels, between the container materials and the sample outgassing, absorption, adsorption, dilution, mixing condensation, etc. Any sample storage device shall be tested as defined by the CFR, section 40 CFR 86.1310-2007(b)(2).

- Sampling system shall have a sample probe and line that are able to sample and collect the dilute exhaust and transfer this sample to collection bags. The sample probe and line shall be heated to 191 +/- 11 deg C.
- Emissions sampling system shall provide dilute exhaust bag filling, evacuation and purging and shall be

either manually controlled or automatically controlled through the host computer interface.
- Bag fill, evacuation, or purge shall be programmable and executable on individual sample storage devices and or on selectable groups or pairs.
- System shall also provide the ability to perform a leak check on the bags.
- Leak check criteria shall be at least 20" Hg vacuum held for 60 seconds with less than 1" Hg loss on individual sample storage devices.
- Total of four independently accessible dilute exhaust sample storage devices, constructed from stainless steel, Teflon, or an alternative inert material shall be provided.
- Sample storage devices shall be maintained at a temperature of 191 +/- 11 deg C.
- Sample handling from the sample probe to the storage devices shall also be maintained at a temperature of 191 +/- 11 deg C.
- System shall he configured to minimize leaks and dead volumes and shall provide a sample capacity that will enable the storage of up to 6 liters of gas collection.
- Sample collection and storage device design shall be such that homogeneous mixing and complete evacuation and vacuum retention are assured.
- Dilute exhaust sample storage bags shall be constructed of two mil thick clear Tedlar or an inert material that minimizes the contributions from outgassing effects at low concentrations and under vacuum.
- Sample storage devices shall be located and plumbed relative to the sampling system such that the residual dead volume is minimized.
- Sample collection and storage system shall be designed to allow easy repair and maintenance of the system.
- Dilute exhaust sample shall be collected at a mass flow rate proportional to the mass flow rate in the primary dilution tunnel.

Option 2:
2007 Compliant Diesel Particulate Matter Sampler, Assembly Required: 1

SPECIFICATION

The following is from 40 CFR 86.1310-2007(b)(6):

(6) Particulate sampling system. This method collects a proportional sample from the primary tunnel, and then transfers this sample to a secondary dilution tunnel where the sample is further diluted. The double-diluted sample is then passed through the collection filter. Proportionality (i.e., mass flow ratio) between the primary tunnel flow rate and the sample flow rate must be maintained within +/- 5%, excluding the first 10 seconds of the test at start-up. The requirements for this system are:

(i) The particulate sample transfer tube shall be configured and installed so that:

(A) The inlet faces upstream in the primary dilution tunnel at a point where the primary dilution air and exhaust are well mixed.

(B) The particulate sample exits on the centerline of the secondary tunnel.

(ii) The entire particulate sample transfer tube shall be:

(A) Sufficiently distant (radially) from other sampling probes (in the primary dilution tunnel) so as to be free from the influence of any wakes or eddies produced by the other probes.

(B) 0.85 cm minimum inside diameter.

(C) No longer than 36 in (91 cm) from inlet plane to exit plane.

(D) Designed to minimize the diffusional and thermophoretic deposition of particulate matter during transfer (i.e., sample residence time in the transfer tube should be as short as possible, temperature gradients between the flow stream and the transfer tube wall should be minimized). Double-wall, thin-wall, air-gap insulated, or a controlled heated construction for the transfer tube is recommended.

(E) Constructed such that the surfaces exposed to the sample shall be an electrically conductive material, which does not react with the exhaust components, and this surface shall be electrically grounded so as to minimize electrostatic particulate matter deposition.

(iii) The secondary dilution air shall be at a temperature equal to or greater than 15 deg.C.

(iv) The secondary-dilution tunnel shall be constructed such that the surfaces exposed to the sample shall be an electrically conductive material, which does not react with the exhaust components, and this surface shall be electrically grounded so as to minimize electrostatic particulate deposition.

(v) Additional dilution air must be provided so as to maintain a sample temperature of 47 deg. C +/- 5 deg. C upstream of the sample filter. Temperature shall be measured with a thermocouple with a 3/16 inch shank, having thermocouple wires with a gage diameter 24 AWG or smaller, a bare-wire butt-welded junction; or other suitable temperature measurement with an equivalent or faster time constant and an accuracy and precision of +/-1.9 deg. C.

(vi) The filter holder assembly shall be located within 12.0 in (30.5 cm) of the exit of the secondary dilution tunnel.

(vii) The face velocity through the sample filter shall not exceed 100 cm/s (face velocity is defined as the standard volumetric sample flow rate (i.e. scm3/sec) divided by the sample filter stain area (i.e., cm2)).

(7) Particulate sampling.

(i) Filter specifications.

(A) Polytetrafluoroethylene (PTFE or Teflon\TM\) coated borosilicate glass fiber high-efficiency filters or polytetrafluoroethylene (PTFE or Teflon\TM\) high-efficiency membrane filters with an integral support ring of polymethylpentene (PMP) or equivalent inert material are required. Filters shall have a minimum clean filter efficiency of 99% as measured by the ASTM D2986-95a DOP test (incorporated by reference at Sec. 86.1).

(B) Particulate filters must have a diameter of 46.50 +/-0.6 mm (38 mm minimum stain diameter).

(C) The dilute exhaust is simultaneously sampled by a single high-efficiency filter during the cold-start test and by a second high efficiency filter during the hot-start test.

(D) It is recommended that the filter loading should be maximized consistent with temperature requirements.

(ii) Filter holder assembly. The filter holder assembly shall comply with the specifications set forth for ambient PM measurement in 40 CFR Part 50, Appendix L 7.3.5, figures L-25 and L-26, with the following exceptions:

(A) The material shall be 302, 303, or 304 stainless steel instead of anodized aluminum.

(B) The 2.84 cm diameter entrance to the filter holder may be adapted, using sound engineering judgment and leak-free construction, to an inside diameter no smaller than 0.85 cm, maintaining the 12.5 deg. angle from the inlet of the top filter holder to the area near the sealing surface of the top of the filter cartridge assembly. Figure N07-2 shows acceptable variation from the design in 40 CFR Part 50, Appendix L. Similar variations using sound engineering design are also acceptable provided that they provide even flow distribution across the filter media and a similar leak-free seal with the filter cartridge assembly.

(C) If additional or multiple filter cartridges are stored in a particulate sampler as part of an automatic sequential sampling capability, all such filter cartridges, unless they are installed in the sample flow (with or without flow established) shall be covered or sealed to prevent communication of semi-volatile matter from filter to filter; contamination of the filters before and after sampling; or loss of volatile or semi-volatile particulate matter after sampling.

(iii) Filter cartridge assembly. The filter cartridge assembly shall comply with the specifications set forth for ambient PM measurement in 40 CFR Part 50, Appendix L 7.3.5, figures L-27, L-28, and L-29, with the following exceptions:

(A) In addition to the specified Delrin /TM/ material, 302, 303, or 304 stainless steel, polycarbonate or acrylonitrile/butadiene/styrene (ABS) resin, or a combination of these materials may also be used.

(B) A bevel introduced on the inside diameter of the entrance to the filter

cartridge, as used by some commercially available automated sequential particulate filter cartridge changers, is also acceptable (see Figure N07-3).

(iv) Particle preclassifier. A particle preclassifier shall be installed immediately upstream of the filter holder assembly (N07-1). The purpose of the preclassifier is to remove coarse, mechanically generated particles (e.g., rust from the engine exhaust system or carbon sheared from the sampling system walls) from the sample flow stream while allowing combustion-generated particles to pass through to the filter. The preclassifier may be either an inertial impactor or a cyclonic separator. The preclassifier manufacturer 50% cutpoint particle diameter shall be between 2.5 micron and 10 micron at the volumetric flow rate selected for sampling of particulate matter emissions. Sharpness of cut is not specifically defined, but the preclassifier geometry shall allow at least 99% of the mass concentration of 1 micron particles to pass through the exit of the preclassifier to the filter at the volumetric flow rate selected for sampling particulate matter emissions. Periodic servicing of the preclassifier will be necessary to prevent a buildup of mechanically separated particles. The particle preclassifier may be made integral with the top of the filter holder assembly. The preclassifier may also be made integral with a mixing-tee for introduction of secondary dilution air, thus replacing the secondary dilution tunnel; provided that the preclassifier provides sufficient mixing.

- Mass of particulate emissions shall be determined from a proportional mass sample collected on a filter and from the sample flow and total flow over the test period.

Option 3:
Proportional Ambient Sampling System, Assembly Required: 1

SPECIFICATION

The following is from 40 CFR 86.1309-90 (c)(5)

Sample collection bags for dilution air and exhaust samples shall be of sufficient size so as not to impede sample flow.

The term sample storage device and "bag" are used interchangeably in this specification to highlight the fact that other types of containers which provide an inert volume of minimal dead volume for sample collection may be comparable and equivalent to the traditional Tedlar bag. Tedlar may induce unwanted HC outgassing. The objective is to minimize any chemical interaction, particularly at very low concentration levels, between the container materials and the sample outgassing, absorption,

adsorption, dilution, mixing condensation, etc. Any sample storage device shall be tested for residual HC hangup by storing HC free air (water saturated at a dewpoint of 60°F) in the device for 24 hours. The concentration shall not change by more than 1 ppmC from the initial THC value. The storage device material shall also have no permeation of C02.

- Sampling system shall have a probe and line that are able to sample and collect the conditioned dilution air and transfer this sample to collection bags.
- Emissions sampling system shall provide ambient collection bag filling, and evacuation and shall be either manually controlled or automatically controlled through the host computer interface.
- Bag fill or evacuation shall be programmable and executable on individual sample storage devices and or on selectable groups or pairs.
- System shall also provide the ability to perform a leak check on the ambient collection bags.
- Leak check criteria shall be at least 20" Hg vacuum held for 60 seconds with less than 1" Hg loss on individual sample storage devices.
- Total of four independently accessible ambient sample storage devices constructed from stainless steel, Teflon, or an alternative inert material shall be provided.
- These devices shall he configured to minimize leaks and dead volumes and shall provide a sample capacity that will enable up to 6 liters of gas collection.
- Sample collection and storage device design shall be such that homogeneous mixing and complete evacuation and vacuum retention are assured.
- Ambient sample storage bags shall be constructed of two mil thick clear Tedlar or an inert material that minimizes the contributions from outgassing effects at low concentrations and under vacuum.
- Sample storage devices shall be located and plumbed relative to the sampling system such that the residual dead volume is minimized.
- Sample collection and storage system shall be designed to allow easy repair and maintenance of the system.
- Ambient sample shall be collected at a mass flow rate proportional to the mass flow rate in the primary dilution tunnel.

Reference for Proportional Ambient Sample Design:

> *William M. Silvis and Richard E. Chase: "Proportional Ambient Sampling: A CVS Improvement for ULEV and Lean Engine Operation," SAE 1999-01-0154, 1999.*

Option 4:
Toxic Sample Collection System, Assembly Required: 1

SPECIFICATION

The purpose of a toxic sample collection system is to collect an independent sample of dilute exhaust gas in several types of devices that can later be analyzed by a batch process in a chemistry laboratory. The challenges of this system are that large quantities of sample are required in order to measure extremely low levels of toxic compounds, and the sample must be preserved in such a way that the compounds of interest are not lost in the sampling process.

- System must be designed so that the entire unit, the probe through the sample collection device, can be easily removed from the primary dilution tunnel and taken to a separate laboratory for analysis.
- Toxic sample collection system consists of a heated sample probe, a heated enclosure containing a filter type sample collection unit, a non-heated sample collection unit, and flow controls and a sample pump.
- Heated probe shall be a 1" ID probe, heated continuously along its length.
- Heated probe shall be controlled to 191 deg C +/- 11 deg C.
- Heated probe shall be nickel plated on the inside surfaces.
- Heated sample collection device shall be a heated filter housing designed for filter collection paper of 110 mm diameter.
- Heated filter housing shall be installed in a heated enclosure.
- Sample pump shall provide flow rates up to 250 Liters per minute.
- Sample pump shall be located outside of the heated enclosure.
- Toxic collection system shall use two critical flow venturi's to control a constant mass flow rate through the sample collection devices.
- Flow rates shall be selectable at 100 liters per minute or 200 liters per minute.

OPTIONS: MAINTENANCE*

Remedial, Preventive, and Replacement Parts and Equipment for the Second through Fourth year after acceptance of the system. (First year shall be covered under warranty)

*** Maintenance Options DO NOT include Optional Equipment.**

Contractor shall provide Remedial, Preventive, and Replacement Parts and Equipment (Not to Exceed) for the Second through Fourth year after acceptance of the system in accordance with Standard Commercial practices..

Remedial Maintenance:

- Remedial Maintenance shall be performed after a service call is placed indicating that system is inoperative or operating with diminished capability.
- The contractor shall have a technician on the job within 72 hours of being notified by the Project

Officer. All work shall be performed during normal working hours

Preventive Maintenance:
Preventive Maintenance is defined as periodic maintenance design to keep the system in operating condition.

- Preventive Maintenance shall be performed once per period (Minimum) or in accordance with Standard Commercial practices.
- Preventive Maintenance date(s) to be determined by the Project Officer.
- Preventive Maintenance shall include inspection and testing of equipment.
- Contractor shall clean, adjust and lubricate equipment according to manufacturer's recommendations and guidelines.

Service Tickets:
- The contractor shall submit to the designated Project Officer upon completion of service work, (Remedial or Preventive) a legible service ticket containing the following information:

1. Date of Service
2. Equipment type, Model and Serial Number
3. Brief Narrative description of work performed
4. Copy of Preventive Maintenance Inspection Report
5. Listing of any parts used, with part numbers as shown on manufacturer's schematic or parts list. Parts used are to be identified as new or exchange items.
6. Signature of Service Person
7. Labor and Replacement parts to be itemized
8. Signature of designated Project Officer accepting work. After normal business hours, signature may be obtained from responsible person in using department or Agency Police.

- A copy of this service ticket must be attached to the invoices submitted for payment. Payment will not be made without a copy of this service ticket attached to the invoice.

Removal of Equipment:
- Any equipment required to be removed from this facility for repair work shall be signed out through the designated Project Officer prior to 4:30 p.m. Monday through Friday.
- Contractor assumes full responsibility for all equipment removed from this facility.

Coordination of Work:
- Contractor shall coordinate a work schedule for preventive maintenance with the designated Project Officer within 30 days of exercise of the option.

Safety Requirements:

- Contractor shall take such safety precautions, such as lock out / tag out procedures and confined space procedures, to protect the lives and health of the occupants of the building.
- Contracting Officer shall notify the Contractor of any noncompliance with the foregoing provisions and the action required to correct the conditions.
- If the Contractor, or his representative, fails or refuses to comply promptly, the Contracting Officer may issue an order stopping all or any part of the work and hold the Contractor in default.

Security Requirements:

- Contractor employees working under this contract who will perform work on-site shall be subject to security screening requirements.
- Contractor is responsible for performing the background checks and for screening unacceptable candidates from the pool of on-site workers.
- Contractor is required to maintain records of background checks and to make them available for government review upon demand.
- Contractor is responsible for completing a background check on each of his employees prior to the employee beginning work on-site.
- Background checks on current employees meeting the criteria established below are considered valid.
- To be valid for employees for whom background checks have not taken place, a background check must be performed within 60 days after exercise of option.
- At a minimum, the background check will include:
    1. National Criminal and Civil Records; (to include Social Security Number Trace)
    2. Verification of US Citizenship or Legal Resident Status;
    3. Written inquiries to appropriate local law enforcement agencies, former employers and supervisors, references, and schools attended by the person under investigation; and
    4. Professional license and certification verification
- EPA may designate certain contractor employees who will be subject to higher levels of scrutiny. In those instances, the employee and the parameters of the investigation will be specified.
- Whenever a contractor becomes aware that the retention of an employee for work at an on-site location under this contract is inconsistent with the interests of national security, such information shall be immediately provided to the Contracting Officer, and the employee shall be immediately removed from the site and replaced with a qualified substitute.

Payment:

- Payment will be made **MONTHLY IN ARREARS** upon submission of a properly prepared invoice for the Contractor.
- Contract Number assigned to this contract must appear on all invoices.
- **As previously set forth, a copy of the service ticket must be attached to the invoice**

submitted for payment. Payment will not be made without an copy of the service ticket attached to the invoice.

Exercise of Options:

- If an option is not exercised for either Remedial or Preventive maintenance in a certain period, then that option is no longer available for exercise in future years.
- For example: If the Preventive Maintenance Option is not exercised in Option Period 2 (Second Year after Acceptance through Third Year after Acceptance), then that Option is NOT AVAILABLE in Option Period 3.

ATTACHMENT 3

TECHNICAL EVALUATION CRITERIA

Technical Evaluation Criteria

Exhaust Emissions Sampling System (CVS)
for Heavy Duty Engine Dynamometer Test Cell 2

Evaluation - - Commercial Items (FAR 52.212-2) (Jan 1999)

A. The Government will award a contract resulting from this solicitation to the responsible offeror whose offer conforming to the solicitation will be most advantageous to the Government, price and other factors considered. The following factors shall be used to evaluate offers: technical proposal, price, delivery, and previous technical experience.

The following requirements shall be evaluated on a Best Value basis. Offerors shall provide information to demonstrate / substantiate that the proposal meets the minimum requirements.

Offerors shall:

1. Demonstrate that the proposal meets all the minimum requirements of the Government as set forth in the Statement of Work.

2a. Demonstrate that the proposal meets the following critical needs:

- Effectively demonstrate how the proposed Primary Dilution Air Processing meets or exceeds EPA's minimum needs in accordance with the Statement of Work.*

- Effectively demonstrate how the proposed Primary Dilution Tunnel meets or exceeds EPA's minimum needs in accordance with the Statement of Work.*

- Effectively demonstrate how the proposed Dilute Exhaust Processing meets or exceeds EPA's minimum needs in accordance with the Statement of Work.*

- Effectively demonstrate how you will provide System Integration to fulfill EPA's needs in accordance with the Statement of Work.*

- Effectively demonstrate how you will meet the requirements identified as General Specifications that include, but are not limited to: Working On-Site at NVFEL, Project Schedule and Engineering Requirements, Demolition, Installation, Commissioning, Acceptance Testing, Training, Warranty, Spare Parts, and Documentation.*

- Contractor shall provide proposals regarding Remedial, Preventive, and Replacement Parts and Equipment (Not to Exceed) for the Second through Fourth Year after acceptance of the system in accordance with Standard Commercial practices.

* The following types of materials may be used to demonstrate ability to meet minimum technical needs: Narrative Technical Specifications, Drawings, Photos, Brochures, Demo Disks, Videos, Etc.

3. Offerors are requested to submit information on previous work that demonstrates experience with development of exhaust emissions sampling systems. Such information may include drawings,

photographs, catalog information, etc.

4. Offerors are requested to submit a list of contracts and subcontracts completed which are similar in nature to this requirement. The contracts and subcontracts listed may include those entered into with Federal, State and Local governments, and commercial businesses, which are of similar scope, magnitude, relevance, and complexity to the requirement which is described in the RFQ. Provide a point of contact for each cited contract and/or subcontract with the name of the client, telephone number, and period of performance.

5. Provide detailed project schedule information and affirmative statements regarding the offerors ability to meet delivery requirements outlined in the Statement of Work. Offerors shall specifically identify how they plan to meet the sixty (60) day requirement for demolition, installation, commissioning, and acceptance testing after approval is provided to render test cell 2 inoperable.

B. Responses to the above factors shall be evaluated on the following scale:

Unacceptable:	Does not meet all requirements of the SOW.
Acceptable:	Meets minimum requirements of the SOW.
Excellent:	Exceeds the Government's minimum requirements.

C. After the responses have been evaluated against the factors above, an order is expected to be placed with the offeror that represents the **Best Value** to the government. Price may not be the determining factor. Best and final offers should be provided. Discussions may be conducted as necessary at the government's discretion after receipt of quotes and proposals.

D. A written notice of award or acceptance of an offer, mailed or otherwise furnished to the successful offeror within the time for acceptance specified in the offer, shall result in a binding contract without further action by either party. Before the offer's specified expiration time, the Government may accept an offer (or part of an offer), whether or not there are negotiations after its receipt, unless a written notice of withdrawal is received before award

ATTACHMENT 4

CLINS

CLINS

BASE

Line Item	Description	Qty	Units	Unit Price	Total Price
0001	Exhaust Emissions Sampling System (CVS) for Heavy Duty Engine Dynamometer Test Cell 2 in accordance with the attached Statement of Work	1	Lot		
0002	Demolition, Installation, Commissioning, and Acceptance Testing in accordance with the attached Statement of Work	1	Lot		

OPTIONS: EQUIPMENT

Line Item	Description	Qty	Units	Unit Price	Total Price
0003	2007 Compliant Heated Gaseous Sample Collection Device in accordance with the attached Statement of Work	1	Lot		
0004	2007 Compliant Diesel Particulate Matter Sampler in accordance with the attached Statement of Work	1	Lot		
0005	Proportional Ambient Sampling System in accordance with the attached Statement of Work	1	Lot		
0006	Toxic Sample Collection System in accordance with the attached Statement of Work	1	Lot		

OPTIONS: MAINTENANCE*

0007 OPTION PERIOD 1 **One Year after Acceptance through Second Year after Acceptance**

Line Item	Description	Est. Qty	Units	Unit Price	Total Price
0007A	Remedial Maintenance - Repair in accordance	200	Hrs	$_____	$_____

	with the attached Statement of Work (Contractor will be reimbursed only for those hours performed).				
0007B	Preventive Maintenance - Repair schedule in accordance with Standard Commercial practices, Minimum 1 per Year. (Contractor will be reimbursed only for those hours performed).	1	Lot	$_____	$_____
0007C	Replacement Parts and Equipment (Contractor will be reimbursed only for those parts and equipment replaced).	1	Lot	NOT TO EXCEED	$_____

0008 OPTION PERIOD 2 **Second Year after Acceptance through Third Year after Acceptance**

Line Item	Description	Est. Qty	Units	Unit Price	Total Price
0008A	Remedial Maintenance - Repair in accordance with the attached Statement of Work (Contractor will be reimbursed only for those hours performed).	200	Hrs	$_____	$_____
0008B	Preventive Maintenance - Repair schedule in accordance with Standard Commercial practices, Minimum 1 per Year. (Contractor will be reimbursed only for those hours performed).	1	Lot	$_____	$_____
0008C	Replacement Parts and Equipment (Contractor will be reimbursed only for those parts and equipment replaced).	1	Lot	NOT TO EXCEED	$_____

0009 OPTION PERIOD 3 **Third Year after Acceptance through Fourth Year after Acceptance**

Line Item	Description	Est. Qty	Units	Unit Price	Total Price
0009A	Remedial Maintenance - Repair in accordance with the attached Statement of Work (Contractor will be reimbursed only for those hours performed).	200	Hrs	$_____	$_____
0009B	Preventive Maintenance - Repair schedule in accordance with Standard Commercial practices, Minimum 1 per Year. (Contractor will be reimbursed only for those hours performed).	1	Lot	$_____	$_____
0009C	Replacement Parts and Equipment (Contractor will be reimbursed only for those parts and equipment replaced).	1	Lot	NOT TO EXCEED	$_____

*** Maintenance Options <u>DO NOT</u> include Optional Equipment**

ATTACHMENT 5

QUALITY ASSURANCE

Quality Assurance Plan

The contractor shall provide demolition, installation, commissioning, and acceptance testing in Heavy Duty Engine Dynamometer Test Cell 2 of an Exhaust Emissions Sampling System (CVS) in accordance with the attached Statement of Work. Required time frame for this action is sixty (60) days from authorization to render Test Cell 2 inoperable. EPA is negatively impacted by a longer period of performance. As such, demolition, installation, commissioning, and acceptance testing of an acceptable product beyond sixty (60) days is to be disincentivized. The following chart details the monetary plan for timely, and late delivery.

Deliverable	Receipt of Deliverable	Incentive/Disincentive	Surveillance Method
Demolition, Installation, Commissioning, and Acceptance Testing completed in accordance with the attached Statement of Work.	0 - 60 days	$0	At a date agreed upon by the Government and the contractor (date shall not be later than 290 days after contract award) in writing, Test Cell 2 will become inoperable. This date will be considered Day 1 with regard to this plan. Completion shall be considered the date that all deliverables set forth here are received by EPA, subject to EPA final approval.
See Above	61 days to Final Delivery	For each day of delivery after the 60 day delivery requirement, the established contract price will be reduced by $3,000.	At a date agreed upon by the Government and the contractor (date shall not be later than 290 days after contract award) in writing, Test Cell 2 will become inoperable. This date will be considered Day 1 with regard to this plan. Completion shall be considered the date that all deliverables set forth here are received by EPA, subject to EPA final approval.